PRICE ONE SHILLING.

1879

THE ILLUSTRATED FARMERS AND GARDENERS ALMANACK.

"FARMER" OFFICE.

SALISBURY SQUARE, LONDON, E.C.

LONDON; SIMPKIN, MARSHALL & Co. EDINBURGH: JOHN MENZIES & Co
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Mowers, Reapers, and Self-Bindi Harvesters

Are the most perfect and reliable Machines made.

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HAVE BEEN MADE AND SOLD IN 1878, MAKING A GRAND TOTAL OF

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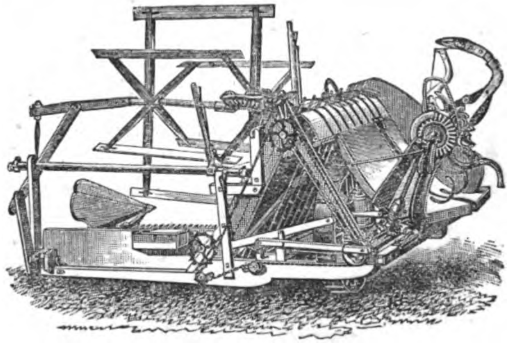

Over **10,000** of

Wood's Self-Binding Harveste

HAVE BEEN MADE AND SOLD UP TO THE PRESENT DATE.

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WALTER A. WOOD was awarded the Cross of Officer of the Legion of Honour fo well-known Machines, being the highest award that can be conferred. Also

TWO GOLD MEDALS

(One in Group 6, Class 51; one in Group 8, Class 76); and

AN OBJET D'ART, OR PRIX UNIQUE,

FOR EXCEPTIONAL MERIT,

FOR HIS

SELF-BINDING HARVESTER,

In connexion with the Trials at Mormant.

Nearly 900 FIRST PRIZES have been gained by WALTER A. WOOD' MACHINES.

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Defies all honest Competition.

Annual Consumption exceeds 17,500,000 lb.

AWARDED GOLD MEDAL AT THE PARIS EXHIBITION, 1878.

BEWARE OF IMITATIONS.

OBSERVE TRADE MARKS AND REAL NAME.

CHOCOLAT-MENIER FOR BREAKFAST.

AWARDED GRAND DIPLOMA AT THE PARIS EXHIBITION, 1878.

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Sold in ½ lb. and 1 lb. Tins, 2s. per lb.

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PLAIN AND MANILLA FLAVOUR.

Sold in ½ lb. and 1 lb. Tins.

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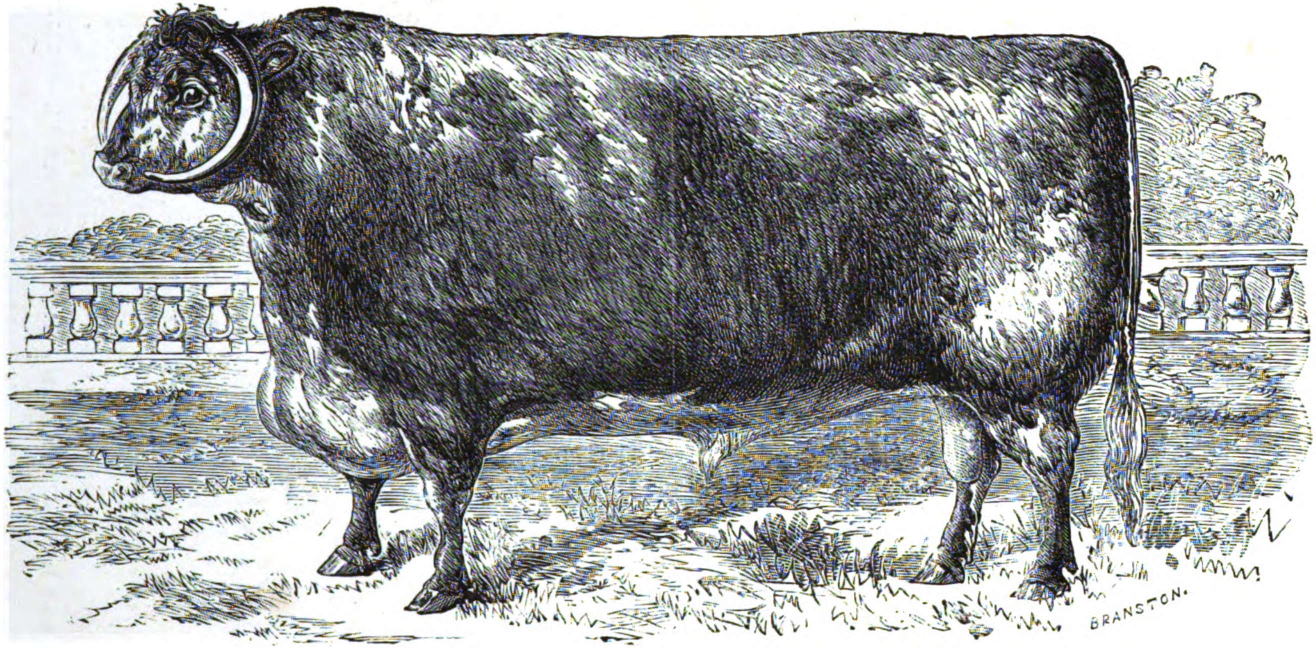

CONQUEROR III,

[See Page 244

THE ILLUSTRATED Farmers and Gardeners Almanack

A YEAR-BOOK FOR THE COUNTRY HOUSE

BIBLIOTHECA
• JUL 79
BODLEIANA

1879

LONDON
"FARMER" OFFICE SALISBURY SQUARE
SIMPKIN MARSHALL & CO., LONDON
JOHN MENZIES & CO., EDINBURGH
AND ALL BOOKSELLERS

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AND
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STOCKINGS,
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IN
EVERY VARIETY.

See the "FIELD," July 17 and July 31, 1869.

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For Classified List of Advertisers, see page 64 of Advertising Sheet.

THE ILLUSTRATED
FARMERS' AND GARDENERS
ALMANACK

Kalendarial Notes.

PRINCIPAL ARTICLES OF THE KALENDAR.

Golden Number (=Lunar Cycle)	18	Solar Cycle	12
Dominical or Sunday Letter	E	Roman Indiction	7
Epact	7	Julian Year or Period	6592

Anno Mundi.—The year 1879 is the latter part of the 5639th and the beginning of the 5640th year since the creation of the world, according to the Jews. The year 5640 commences on September 18, 1879.

Mohammedan Year.—The year 1297 of the Mohammedan Æra commences on December 15, 1879, and Ramadan (Month of Abstinence observed by the Turks) commences on August 19, 1879.

THE SEASONS.

Spring Quarter begins	March 20	midnight.	Autumn Quarter begins	Sept. 23	10.0 a.m.
Summer ,,	June 21	8.0 p.m.	Winter ,,	Dec. 22	4.0 a.m.

ECLIPSES.

In the year 1879 there will be two Eclipses of the Sun and one of the Moon.

Jan. 22.—*Annular Eclipse of the Sun.* Invisible from Europe. The central eclipse begins G.M.I. on the western coast of South America, thence across to eastern coast and South Atlantic Ocean to the western coast of Africa. The eclipse ends at 1.43 p.m.

July 19.—*Annular Eclipse of the Sun.* Seen only as a small eclipse from the south of Europe. Begins at 7.13 a.m. in the North Atlantic Ocean, crossing to west coast of Africa; ends at 10.55 a.m.

Dec. 18.—*Partial Eclipse of the Moon.* Visible from Greenwich. Begins at 3.37 p.m. The Moon will rise at 3.47 p.m., or ten minutes after the eclipse has begun; the middle of the eclipse will take place at 4.26 p.m., and will end at 5.15 p.m. One-sixth of the Moon's diameter will be obscured at the time of the greatest phase.

FIXED AND MOVABLE FESTIVALS, ANNIVERSARIES, &c.

Epiphany	Jan.	6	Good Friday	April	11	Advent Sunday	Nov.	30
Septuagesima Sunday	Feb.	9	Easter Sunday	,,	13	Christmas Day	Dec.	25
Quinquagesima Sunday	,,	23	Rogation Sunday	May	18	St David's Day	March	1
Ash Wednesday	,,	26	Ascension Day	,,	22	St Patrick's Day	,,	17
First Sunday in Lent	March	2	Whit Sunday	June	1	St George's Day	April	23
Palm Sunday	April	6	Trinity Sunday	,,	8	St Andrew's Day	Nov.	30

QUARTER DAYS.

ENGLAND.			SCOTLAND.		
Lady Day	March	25	Candlemas	Feb.	2
Midsummer Day	June	24	Whitsunday	May	15
Michaelmas Day	Sept.	29	Lammas	Aug.	1
Christmas Day	Dec.	25	Martinmas	Nov.	11

BANK HOLIDAYS.

ENGLAND.			SCOTLAND.		
Good Friday	April	11	New Year's Day	Jan.	1
Easter Monday	,,	14	Good Friday	April	11
Whit Monday	June	2	First Monday of May	May	5
First Monday of August	Aug.	4	,, ,, August	Aug.	4
Christmas Day	Dec.	25	Christmas Day	Dec.	25
Boxing Day	,,	26			

JANUARY 31 Days

THE MOON'S CHANGES.

○ Full Moon, 8th, 11.47 a.m. | ● New Moon, 22d, 11.50 a.m.
☾ Last Quar., 15th, 11.1 a.m. | ☽ First Qr., 30th, 11.44 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Dec.	Oct.	May	May	Mar.	
1	W	*Circum.* Bank Holiday in Scot.	7	13	25	1	2	1
2	Th	Day breaks 6h. 32m. Sun Perige	8	14	26	2	3	2
3	F	Sun rises 8h. 8m., sets 4h. 1m....	9	15	27	3	4	3
4	S	Eruption of Vesuvius, 1868......	10	16	28	4	5	4
5	**S**	2 Sunday after Christmas	11	17	29	5	6	5
6	M	**Epiphany.** *Plough Monday*......	12	18	30	6	7	6
7	Tu	Great Gales, U.K.,'39; U.S.,'73	13	19	31	7	8	7
8	W	Sun 22° 23′ south equator.........	14	20	June 1	8	9	8
9	Th	Napoleon III. died, 1873 [1778	15	21	2	9	10	9
10	F	Penny Post, 1840. Linnæus d.,	16	22	3	10	11	10
11	S	Hilary Term begins	17	23	4	11	12	11
12	**S**	1 Sunday after Epiphany.........	18	24	5	12	13	12
13	M	42° Frost, London, 1820	19	25	6	13	14	13
14	Tu	Oxford Lent Term begins	20	26	7	14	15	14
15	W	Frost Fair on Thames, 1815 ...	21	27	8	15	16	15
16	Th	Moon south 6h. 27m. A.M.........	22	28	9	16	17	16
17	F	*St Anthony*—Patron of Cattle...	23	29	10	17	18	17
18	S	Old Twelfth Day	24	30	11	18	19	18
19	**S**	2 Sunday after Epiphany.........	25	31	12	19	20	19
20	M	*Fabian.* Eng. Wheat, 52/1, '78	26	Nov. 1	13	20	21	20
21	Tu	*St Agnes.* Sun eclip., invis. U.K.	27	2	14	21	22	21
22	W	*St Vincent*—a weather period ...	28	3	15	22	23	22
23	Th	Venus and Jupiter in conjunction	29	4	16	23	24	23
24	F	Heavy Gale in London, 1872 ...	30	5	17	24	25	24
25	S	*St Paul.* Fair at Derby.........	31	6	18	25	26	25
26	**S**	3 Sunday after Epiphany.........	Jan. 1	7	19	26	27	26
27	M	Moon south 3h. 50m. P.M..........	2	8	20	27	28	27
28	Tu	Night 15h. 5m. long	3	9	21	28	29	28
29	W	Snowdrop flowers. Thrush sings	4	10	22	29	30	29
30	Th	Mean rainfall, Jan. 1877, 4.7 in.	5	11	23	30	31	30
31	F	Hilary Term ends..................	6	12	24	31	April 1	31

FAIRS FOR 1879.

A SELECTION OF THE PRINCIPAL FAIRS IN THE KINGDOM.

The dates of Fairs being continually changed, we do not hold ourselves responsible for any inaccuracy; every care, however, is taken to keep the list as correct as possible. Visitors from a distance should always ascertain, by letter, the exact date before making their journey. Abbreviations:—c., Cattle; h., Horses; sh., Sheep; st., Stock; pl., Pleasure.

January.
1—Stockport, cattle
2—Banbury, horses
5—Bolton, cows
6, 11—Preston, horses
13—Oakham, cattle, horses, sheep
17—Nottingham, cattle
20, 21—Melton-Mowbray, c., pl.
20, 23—Banbury, horses
27—Stalybridge, cattle, horses, sh.
31—Chester, cattle, h., pigs, sh.
31.—Ripon, cattle, horses

BREEDER'S KALENDAR.—This Kalendar gives data for determining the time of gestation of the domesticated animals. For instance, if it is required to know on what day a cow will calve which has had intercourse with the bull on February 15, a glance across the page from February 15 until the column headed "Cow" is reached, will give November 27 as the probable date; and so on of all the other animals.

GARDEN KALENDAR FOR JANUARY

More than half of the success of gardening springs from doing everything at the right time. The other half comes of doing things in a proper manner, and placing things in the best places. In our instructions we shall endeavour to keep these all in mind; and if our readers will do likewise, we trust their gardens will not only prosper, but that the work in them will constitute one of their chief delights. In assessing the value of gardens, the many hours of happiness and healthful recreation they bring, are too often left out of the account. These, however, are of far more value to many than all else. Fresh-grown vegetables, clean, tender, and crisp; fruit, luscious and sweet; and flowers grown at home, fragrant and beautiful, are boons of the highest order; but the thought, the labour, and the love bestowed upon them exceed and transcend all. To this labour we must lead you.

Kitchen Garden.

Trench and manure borders for early crops. Sow early frame Peas, preferring the white Warwick variety and Early Charlton in the beginning of the month, and Knight's Dwarf Early Marrowfat about the end of the month; Marshall's Early Dwarf, Early Mazagan, and Longpod Beans during the first and last weeks; a few Onions, Early Horn Carrots, and Round-leaved Spinach for early crops, on very light soils; as also Curled Parsley, if not done in August, on a warm border; short-topped Radish in two or three sowings, at a week's interval, in the same situation. In the last fortnight, sow Hardy Green and Brown Dutch Lettuce.

Plant fruit trees in general, in open weather, mulching the trees to protect them from the drought which may occur in spring. Plant Shallot and Garlic.

Prune all sorts of fruit trees in mild weather or in moderate frosts, nailing only in fine weather; wash those trees infested with insects, with a mixture of soap-suds, flowers of sulphur, and Tobacco liquor.

Forcing Department.

About the end of the month, prepare for making up hotbeds for early Cucumbers and Melons, at least where a pit heated with hot water is not in use. Sow salads, Carrots, and Kidney Beans on slight hotbeds. Sow Peas in cold frames for transplanting. Force Asparagus, Seakale, and Rhubarb in hotbeds, in pits, in the Mushroom house, or in the open garden by covers surrounded with litter. Give air in fine weather, and water sparingly, to the Pinery and Cucumber pit; and to other forcing houses, according to the progress of the trees. Attend to forced Kidney Beans and Strawberries. Give abundance of air to the greenhouse, conservatory, and Alpine frame, but little water. Continue to force Roses, Kalmias, Rhododendrons, and hardy flowers and bulbs for the decoration of the greenhouse, or to be taken into the lobby or the drawing-room. Most of these ought to be potted and prepared in autumn.

Flower Garden.

Plant dried tubers and bulbs of border flowers, if not done in autumn; but the planting of the roots of the finer florists' flowers ought to be deferred till next month.

Transplant herbaceous plants and evergreen shrubs in light soils, if not done in autumn; also deciduous trees, shrubs, and hedges. Lay edgings in fine weather.

Sow Mignonette, Stocks, and other annuals in pots; sow Sweet Peas, and a few hardy annuals, on a warm border. Give Stage Auriculas and Carnations abundance of air; but keep them rather dry, to prevent damping off.

THE WEATHER AND MARKETS.

The weather character of the month of January 1878 was above the mean heat of mid-winter of this century, and marked by great fluctuations in the barometer. There was two periods of frost, one of them coinciding with a high, and the other with a low barometer. The record shews 30.67 inches of the mercury on the 11th, 12th, and 13th, 29.38 inches on the 25th. The highest shade temperature was 53 deg. on the 22d, the lowest 25 deg. on the 11th, when the grass temperature was as low as 14 deg. Frosts occurred in the shade seven times, on the grass seventeen times. The total rainfall of the month was 1.15 inch, or not half the average. There were fourteen rainy days; on the 28th the register was 0.36 inch. The second and last weeks were the coldest. There was a dense fog in London on the 17th. On the 21st and 22d, S.W. and W. gales prevailed. The sky was dull or cloudy on most days, although from the 10th to 21st scarcely any rain fell.

The last market in Mark Lane of 1877, held on the 31st, bequeathed firmness in value, and firmness in conviction as to that value being sound; but it died slowly, and with a very subdued spirit in which no enterprize flickered. The prices for arrived cargoes of Wheat were 52/ for No. 2 American Spring, 30/ for mixed Maize. Prices asked for Californian and Australian Wheat was 59/, for Odessa Wheat on raising the blockade, 44/ per qr.

Wheat ranged 51/8, 52/1, 52/1, 51/10, having only varied 1/ to 2/ in price since the first week in November.—The market history of the month records harassing uncertainty, disturbing trade through the rapid events of the Russian war, peace being daily expected and daily deferred. America made considerable mid-winter shipments of Wheat. The Australian harvest was found to be an excellent one, and likely to furnish a large export—probably 1,000,000 qr. to all parts. The crop prospects of India were uncertain; but, remembering the shipments of 1877 as 1,500,000 qr., merchants looked forward for a similar supply in early summer. The rainfall in California had been ample to promise a future good season. Agricultural work went on in the United Kingdom without much interruption, late wheat-sowings being often completed. The light night frosts were enough to keep vegetation in healthy check. Prices of corn in England and France tended downwards. The stock of Wheat in the chief ports was about 1,750,000 qr., or 500,000 qr. more than was held in January 1877, but the quantity on passage was much less. The supplies of foreign Wheat and Flour in four weeks were computed at 1,660,000 qr., the supply from farmers at 587,200 qr.

FEBRUARY 28 Days

THE MOON'S CHANGES.

○ Full Moon, 7th, 1.42 a.m.
☾ Last Qr., 13th, 6.53 p.m.
● New Moon, 21st, 4.3 a.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Jan.	Nov.	June	June	April	
1	S	Shooting ends. Salm. Fish. begins	7	13	25	1	2	32
2	**S**	4 Sun. after Epiph. *Candlemas*	8	14	26	2	3	33
3	M	Moon south 9h. 26m. P.M.	9	15	27	3	4	34
4	Tu	Sun rises 7h. 36m., sets 4h. 52m.	10	16	28	4	5	35
5	W	Sun after clock 14m. 14s.	11	17	29	5	6	36
6	Th	Severe Gale, 1850	12	18	30	6	7	37
7	F	Sun's declination 15° 19′ south...	13	19	July 1	7	8	38
8	S	Half-Qr. Day. Sun & Jupiter conj.	14	20	2	8	9	39
9	**S**	Septuagesima. Primrose flowers	15	21	3	9	10	40
10	M	Mean temperature, 38° 78′	16	22	4	10	11	41
11	Tu	Length of day 9h. 40m.	17	23	5	11	12	42
12	W	Average of frosty nights, 11......	18	24	6	12	13	43
13	Th	Bingham S.H. Sale. Entries close	19	25	7	13	14	44
14	F	*St Valentine*	20	26	8	14	15	45
15	S	English Wheat, 50/11, 1878 ...	21	27	9	15	16	46
16	**S**	Sexagesima	22	28	10	16	17	47
17	M	Wild Fowl close time begins ...	23	29	11	17	18	48
18	Tu	Sun rises 7h. 11m., sets 5h. 18m.	24	30	12	18	19	49
19	W	Great Storm, 1877	25	Dec. 1	13	19	20	50
20	Th	Earthquake at Malta, 1868	26	2	14	20	21	51
21	F	Crocus flowers	27	3	15	21	22	52
22	S	Cambridge Lent Term divides	28	4	16	22	23	53
23	**S**	Quinquagesima	29	5	17	23	24	54
24	M	*St Matthias*	30	6	18	24	25	55
25	Tu	*Shrove Tuesday*	31	7	19	25	26	56
26	W	**Ash Wednesday**	Feb. 1	8	20	26	27	57
27	Th	Corn Laws abolished, 1849	2	9	21	27	28	58
28	F	Hare Hunting ends	3	10	22	28	29	59

February.

2—Burton-on-Trent, cattle
2—Doncaster, cattle, horses, stock
2—Reading, cattle, horses
3—Bath
3—Leighton Buzzard
3—Plymouth
3—Pomfret
7, 8—Darlington, horses
8—Leek
8—Llandaff
8—Howey
8—Nantwich, cattle, sheep
10—Oakham, cattle, horses, sheep
11—Llandyssell
11—Wymonham
11, 12—Stamford, cattle, h., sh.
12—Leek, cattle, pleasure
13—Ashbourne, cattle
14—Maidstone, cattle, h., pl.
14—Wymondham, cattle, horses
15—Devizes
15—Loughborough
15—Northallerton
16—Market Harborough
17—Egremont, cattle, horses
17—Rugby
18—Cockermouth, horses
20—Lutterworth
21—Northampton
22—Newport Pagnel
23—Winchester, sheep
24—Frome
24—Thirsk, cattle, sheep
25—Oundle
26—Newton-Abbot, cattle, horses
28—Chester, cattle, h., sh., pigs

BRITISH INDIA.—The total area is about 1,558,254 square miles, and the population over 240 millions. Two-fifths consist of independent States, which acknowledge the supremacy of Great Britain, and are entirely under our control. The total extent and population of this gigantic possession may be fairly compared to the whole of Europe exempting Russia.

GARDEN KALENDAR FOR FEBRUARY.

Kitchen Garden.

Continue to trench and manure the quarters for early crops. Sow Beans and Peas in the beginning and also at the end of the month; a few early Cabbages, to replace the last sowing in August; Red Cabbages and Savoys in the last week. Sow also Early Horn Carrot, Dutch Turnip, Onions for a full crop in light soils, with a few Scotch Leeks. Sow Chervil, Fennel, and Lettuce for succession, with Radishes and Round-leaved Spinach, twice in the course of the month; small salads every fortnight.

Plant Jerusalem Artichokes, Garlic, Horse-Radish, and Early Potatoes; in the last week, a full crop of early Cabbages on light soil. All sorts of fruit trees may still be planted; Strawberries about the end of the month. Transplant for seed, if not done before, all the Brassica tribe, including Cabbage, Cauliflower, Turnip, &c.; also Carrots, Onions, Beet, Celery, Endive, Leeks, and Parsnips. Transplant to the bottom of the south-aspected wall a few of the Peas sown in November for the first crop.

Prune Apricots, Peaches, Nectarines, and Plums before the buds be much swelled; also Apples, Pears, Cherries, Gooseberries, Currants, and Raspberries before the end of the month. Finish the dressing of Vines. Keep the fruit-room free from soiled fruit, and shut it close, admitting as little air as possible.

Forcing Department.

Plant out Melons and Cucumbers on hotbeds and in pits, sowing more for succession. Sow Carrots, Turnips, and early Celery; Cauliflower to be afterwards planted out. Sow New Zealand Spinach in pots. Plant early Potatoes on slight hotbeds. Continue the forcing of Asparagus, Rhubarb, and Seakale. Pine Apple plants require little air or water at this season, except young plants in dung-frames, which ought to be kept free from damp. Shift fruiting plants by the middle of the month, if not done in August. Continue the forcing of all sorts of fruits. Those who have not commenced sooner, and who have a small establishment, will find the middle or end of this month a good season to begin the forcing of Vines or Peaches. Be careful to protect the stems of Vines that are outside of the forcing houses.

Let the greenhouse and conservatory have plenty of air in mild weather. Put in an extra quantity, if not done in autumn, of cuttings of desirable half-hardy greenhouse genera for the flower garden, such as Pelargonium, Fuchsia, Salpiglossis, Calceolaria, Heliotropium, Salvia, Verbena, Petunia, Alonsoa, Mimulus, Lobelia, Maurandya, Tropæolum, Bouvardia, Rodochiton, Leptospermum, Anagallis. Many species and varieties of such genera are of great beauty, and contribute most essentially to the rich appearance of the flower garden during the summer and autumn months. Sow Stocks, a few tender annuals, and Dahlia seed on a slight hotbed or in pots.

Flower Garden.

In good weather, plant dried roots, including most of the finer florists' flowers. Continue the transplanting of hardy biennial flowers, and perennial herbaceous plants, shrubs, and deciduous trees.

Sow in the last week Mignonette, and several species of hardy annuals, in a warm border for subsequent transplanting—particularly Clarkia, Collinsia, Collomia, Eutoca, Gilia, Limnanthes, Nemophila, and Œnothera.

THE WEATHER AND MARKETS.

The total rainfall of this month was 1.10 inch, or nearly ½-an-inch below the average. This fell during part of ten different days, the greatest fall on any one day being 0.52 inch on the 14th. The highest temperature in the shade was 61 deg. on the 17th; the lowest 25 deg., on the 8th, when the grass temperature was 20 deg. Frosts occurred in the shade five times, on the grass eleven times.

The barometer ranged 0.97 of an inch; attained 30.64 inches on the 21st and 22d, and sank to 29.67 inches on the 27th.

The first days of the month were very damp and gloomy, often with thick fogs, winds S.W. or S. After a few fine days, 6th to 8th, rainy weather prevailed to the 16th; next a fine and mild time succeeded for another three days, and the rest of the month was variable.

There was no real winter in February. Vegetation became forward, there being enough moisture, although the winter season had been generally dry. The Wheat plant looked healthy and vigorous.

All Europe recorded the winter as generally mild, and many ports, usually closed with ice, were able to be navigated.

The markets and prices of February were generally dull. English Wheat, 51/11, 55/5, 50/11, 51/3, fluctuating but 1/ per qr.

The four weeks' foreign supplies of Wheat and Flour were considerable—about 1,063,000 qr. The English supplies, 657,500 qr., were moderate. The two sources were reckoned to furnish about enough for consumption without trenching on stocks. The quantity of Wheat afloat changed but little during February. Political excitement was acute through the near approach of the Russian army to Constantinople, and a mistrust of their future action. Russian grain arrived in larger bulk than expected, *via* the Baltic ports. The Atlantic ports forwarded in four weeks 567,500 qr., so that the great home deficiences of the English Wheat crop was entirely relieved. According to the varying rumours of peace, or extended war, value fluctuated—once gaining 1/, afterwards receding 2/ to 3/—for imported Wheat.

The Australian crop commenced to be freely shipped. The Californian prospects were considered assured, and the prospects of the French Wheat fields were fair in all departments. American and Russian Red samples of Wheat were 46/ to 48/; fine foreign white Wheat, 54/ up to 60/.

The average price of 5 qr. of Indian Wheat to growers was reckoned £5, 10/, as against £11, 4/ in England.

MARCH 31 Days

THE MOON'S CHANGES.
☽ First Quar., 1st, 7.58 a.m. | ☾ Last Quar., 15th, 3.41 a.m.
○ Full Moon, 8th, 1.9 p.m. | ● New Moon, 22d, 9.4 p.m.
First Quar., 31st, 1.5 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Feb.	Dec.	July	June	April	
1	S	*St David.* Sun rises 6.48, sets 5.37	4	11	23	29	30	60
2	**S**	1 SUNDAY in LENT. *St Chad* ...	5	12	24	30	May 1	61
3	M	Wheat 50/10, Barley 43/6, 1878	6	13	25	July 1	2	62
4	Tu	Mean rainfall, 1.6 in.	7	14	26	2	3	63
5	W	Bingham S. H. Show, two days	8	15	27	3	4	64
6	Th	Temperature of evapor., 39° 5′...	9	16	28	4	5	65
7	F	*St Perpetua.* Clock 11m. 15s. fast	10	17	29	5	6	66
8	S	Rainy days in month, 10	11	18	30	6	7	67
9	**S**	2 SUNDAY in LENT	12	19	31	7	8	68
10	M	Wheat 50/2, Barley 43/2, 1878	13	20	Aug. 1	8	9	69
11	Tu	Mean night temperature, 35° 73′	14	21	2	9	10	70
12	W	*St Gregory*..........................	15	22	3	10	11	71
13	Th	Common Elder leaves	16	23	4	11	12	72
14	F	Sun's declination, 2° 33′ S.........	17	24	5	12	13	73
15	S	Laurel flowers, Lilac leaves	18	25	6	13	14	74
16	**S**	3 SUNDAY in LENT..................	19	26	7	14	15	75
17	M	*St Patrick.* Wheat 49/6, 1878	20	27	8	15	16	76
18	Tu	Gooseberry tree leaves............	21	28	9	16	17	77
19	W	Elm flowers	22	29	10	17	18	78
20	Th	*St Cuthbert.* Spring com.	23	30	11	18	19	79
21	F	*St Benedict.* Sun N. of equator	24	31	12	19	20	80
22	S	Sun rises 6h. 1m., sets 6h. 14m.	25	Jan. 1	13	20	21	81
23	**S**	4 SUNDAY in LENT..................	26	2	14	21	22	82
24	M	Great gale, *Eurydice* found., 1878	27	3	15	22	23	83
25	Tu	*Annunciation. Lady Day*	28	4	16	23	24	84
26	W	[25. Overseers appointed......	Mar. 1	5	17	24	25	85
27	Th	Swallows appear	2	6	18	25	26	86
28	F	War decl. with Russia, 1854 ...	3	7	19	26	27	87
29	S	Wheat 48/9, Barley 41/5, 1878	4	8	20	27	28	88
30	**S**	5 SUNDAY in LENT.................	5	9	21	28	29	89
31	M	Peace of Paris, 1856..............	6	10	22	29	30	90

March.
2—Leicester, cattle, horses, sheep
3—Bradford, cattle, horses, pl.
3—Darlington, cattle, horses
4—Bolton, cows
4—Stockport, cattle
5, 6—Shrewsbury, horses
6—Bury, cattle, horses
6—Warrington
7—Blandford, cattle, horses, sheep
7—Nottingham, cattle
7—Uppingham, cattle, horses
8—Warwick
9—Maidstone
10—Windham
11—Leicester
13—Wentlock
13—Sudbury
13—Seaford
14—Northop
14—Oakham, cattle, horses, sheep
15—Alston Moor, cattle, sheep
15—Nantwich
15—Oswestry
15—Torrington, cattle
15—Woodbridge, cattle, h., sh.
18—Merthyr Tydvil
20—Ruthin
20—Winsloe
22—Derby
23—Woburn
24—Hexham, cattle, h., sh.,
24—Stamford, horses
25—Stockport, cattle
25—Uxbridge, cattle, horses, sheep
26—Chorley, cattle, horses, sh.
26—Nantwich, cattle, sheep
27—Horncastle, cattle, sheep
28—Chester, cattle, h., sh., pigs
28—Loughborough, cattle
28—Watford
28—Malmsbury
29—Durham
30—Wilmslow
31—Huddersfield

GARDEN KALENDAR FOR MARCH.

Kitchen Garden.

Main crops of Peas, Beans, Cabbages, and Onions, Leeks, Carrots, Parsnips, Brussels Sprouts, Borecoles, Lettuces, and Spinach are now to be sown. At the end of the month, sow Turnips and Savoys. In the last fortnight, sow Asparagus, Cauliflower, Seakale, Couve tronchunda, Cardoons, Celery, and most of the culinary aromatics, as Dill, Fennel, Parsley. Small salads, should be sown every ten days.

Plant early Potatoes in the first week, and a main crop during the last fortnight. Strawberries, Jerusalem Artichoke, Seakale, Asparagus, and Peas raised in frames, may now be planted out. Full crops of Cabbages should also be planted out. Propagate by slips the various pot-herbs.

Fruit Garden.

Finish the planting and pruning of fruit trees before the middle of the month. Protect those coming into blossom with the various coverings usually employed, or by giving a little heat to flued walls. Begin grafting in the third week. Kill wasps when they first appear, for the death of every individual at this period is equal to the destruction of a colony in autumn.

Forcing Garden.

Proceed with the forcing of Melons and Cucumbers, giving air, and applying linings to maintain the proper temperature. Examine Pine Apple suckers and crowns, potting those that have been kept in tan during the winter; re-potting those that require larger pots, and dressing the roots of such as are sickly; about the middle of the month, shift to the succession pit, and give a top-dressing to the fruiting plants: turn the tan, and add new bark to the pits, to keep up bottom-heat. In the Vinery and Peach house, attend to the keeping down of insects by watering; and promote the growth of the young shoots by steaming in the evenings. Graft Vines when the shoots are sprung about 15 inches. Sow seeds of Capsicum and Tomato; also tender annuals for the stove. Sow salads, Early Horn Carrot, and early Dutch Turnip on slight hotbeds during the first fortnight; as also Celery and Cauliflower for transplanting. Force Strawberries and Kidney Beans, and hardy flowers and bulbs.

Greenhouse.

More water may be given than formerly. Sow seeds of greenhouse and hothouse plants; also the different sorts of tender annuals; pot off those sown last month. Shift greenhouse and stove plants; plant Tuberoses in pots for forcing; remove the forced shrubs and plants, as they come into flower, from the forcing houses to the conservatory; attend to the Alpine and Auricula frames. Begin to propagate greenhouse and stove plants by cuttings.

Flower Garden and Shrubbery.

In the last week, sow hardy annuals in the borders, with biennials that flower the first season; as also perennials. Plant Anemone and Ranunculus roots. Transplant from the nursery to their final sites annuals sown in autumn, with biennials and perennial herbaceous plants. Propagate perennials from root-slips and offsets. Protect Tulips, Hyacinths, and choice flowers from severe weather. In the last week, put into heat the finer sorts of Dahlias, so as to start them, and prepare them for propagation by cuttings and by division of the roots. In the first week, complete the planting of hardy deciduous trees and shrubs; and finish the planting of Evergreens by the middle; but some of the hardier sorts may still be planted towards the end of the month.

THE WEATHER AND MARKETS.

Barometer, highest, 30.65 inches on 16th; lowest, 29.20 inches on 29th; range, 1.45 inch.

Thermometer in shade, 59 deg., highest on 3d; lowest, 25 deg. on 17th and 26th; range, 34 inches. Mean temperature, 42.4, or 0.8 above average; sixteen nights below 30 deg. on grass.

Rainfall, 0.95 inch, or 0.62 below average; falling on nine days; on 29th, cold snow-showers fell.

The weather during this month has exhibited very marked contrasts as regards its temperature, wind, and rainfall. The month commenced with a stiff south-westerly gale, which was succeeded by a sudden rise of the barometer, a fall of temperature, and shift of wind to the westward. On the 7th and 8th a strong N.W. gale swept over the country and past eastwards to Germany and Denmark. Then followed a period of mild dry weather, which continued with little interruption till the 20th. During a portion of this time the nights were very cold, but the days mild and genial. The weather in the north was particularly fine until the 21st, when a sudden change from genial spring weather to hard winter took place and spread rapidly all over the country. Cold northwesterly gales and snow were very general, accompanied by severe local squalls, one of which caused the loss of H.M.S. *Eurydice*, on the 24th, near the Isle of Wight. After a day or two of quiet weather, another gale, this time from the eastward, set in over the southern parts of the kingdom, with much snow.

The price of English Wheat was 50/10, 50/2, 49/6, 48/11, a range that had been closely kept from the 1st December, when 51/7 was the average. Bread sold at from 6d. to 10d. per loaf. Trade was harassing and disappointing. Competition made Flour cheap. Prospects of a settled peace influenced the grain markets strongly. The supply of Wheat on passage was lower than that of 1877, being only 983,715 qr. The American visible supply was scarcely 1,000,000 qr., and the New York market kept steady. France bought largely of supplies offered from the Black Sea. The future summer shipments from Egypt were expected to be very small. India, from its season, was looked upon to export moderately (an expectation that was afterwards proved without foundation). Oregon Wheat was worth 57/ to 58/, Milwaukie 52/, white Michigan, in great favour with Continental buyers, made 59/, Odessa Ghirka Wheat 47/6. At this period, the Atlantic shipments to the United Kingdom were between 60,000 and 70,000 qr. weekly, and France took direct nearly as much, to the surprise of English merchants. Maize was largely shipped from America, about 170,000 qr. weekly, to this country, and 50,000 qr. to the Continent. This month the English Wheat average, in sinking below 50/ per qr., fell below its level for many months. In Mark Lane, 62/ to 64/ per qr. was realized, being nearly 10/ above American varieties. The exports of Wheat rose considerably over 15,000 qr. in one week, having been taken for French account. London Wheat stocks at end of March, about 440,000 qr., against 180,000 qr. in 1877.

APRIL 30 Days

THE MOON'S CHANGES.

○ Full Moon, 6th, 10.24 p.m. | ● New Moon, 21st, 1.56 p.m.
☾ Last Quar., 13th, 2.9 p.m. | ☽ First Quar., 29th, 2.16 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Mar.	Jan.	Aug.	July	May	
1	Tu	Prince Bismarck born, 1815......	7	11	23	30	31	91
2	W	Cobden died, 1865	8	12	24	31	June 1	92
3	Th	Cowslips flower......................	9	13	25	Aug. 1	2	93
4	F	Cambridge Lent Term ends ...	10	14	26	2	3	94
5	S	Oxford Lent Term ends	11	15	27	3	4	95
6	𝕾	PALM SUNDAY. *Old Lady Day*	12	16	28	4	5	96
7	M	Mean temperature, 46° 78′	13	17	29	5	6	97
8	Tu	Temp. evaporation, 43° 3′	14	18	30	6	7	98
9	W	Fire Insurance lapse if unpaid...	15	19	31	7	8	99
10	Th	Indian Mutiny, 1857. Maundy	16	20	Sept. 1	8	9	100
11	F	Good Friday. ....[Thursday	17	21	2	9	10	101
12	S	Arthur Young died, 1820.........	18	22	3	10	11	102
13	𝕾	EASTER SUNDAY......................	19	23	4	11	12	103
14	M	Bank Holiday	20	24	5	12	13	104
15	Tu	Law Easter Term begins.........	21	25	6	13	14	105
16	W	Oxford Easter Term begins ...	22	26	7	14	15	106
17	Th	Lowest night temp., 38° 72′......	23	27	8	15	16	107
18	F	Cambridge Easter Term begins	24	28	9	16	17	108
19	S	*Alphege*	25	29	10	17	18	109
20	𝕾	*Low Sunday. St Agatha*	26	30	11	18	19	110
21	M	Rainy days in month, 11	27	31	12	19	20	111
22	Tu	Nightingale first heard............	28	Feb. 1	13	20	21	112
23	W	*St George.* Wheat 51/2, 1878	29	2	14	21	22	113
24	Th	Mean rainfall, 1° 8′	30	3	15	22	23	114
25	F	*St Mark*	31	4	16	23	24	115
26	S	Sun rises 4h. 45m., sets 7h. 13m.	April 1	5	17	24	25	116
27	𝕾	2 SUNDAY after EASTER	2	6	18	25	26	117
28	M	Clock before sun, 2m. 33s.	3	7	19	26	27	118
29	Tu	Emperor of Russia born, 1818...	4	8	20	27	28	119
30	W	Moon south, 8h. 1m. P.M..........	5	9	21	28	29	120

April.

1—Stamford, cattle, sheep
2—Pontypool, stock
3—Chesterfield
3—Stafford
4, 5—Thirsk, cattle, sheep
5—Burton-on-Trent, cattle, cheese
5—Gloucester, cattle
5—Leicester, cattle, horses, sheep
7—Atherstone
7—Oakham, cattle, horses, sheep
8—Malton, cattle, sheep
8—Hull, cattle
9—Melton-Mowbray, cattle
10—Barnet
10—Horncastle, cattle, sheep
10—Nottingham, cattle, pleasure
10—Northwich, cattle
10—Todmorden, cattle
12—Tamworth
14—Darlington, cattle, horses
14, 15—Romsey, c., h., sh., pigs
15—Gainsborough, c., h., sh., pl.
15—Selby, cattle, horses
15—Stamford, cattle, sheep
15—Thame, cattle
16—Cockermouth, cattle
16—Wellingborough, cattle, pl.
17—Keswick, cattle, sheep
17—Wareham, c., h., sh., pigs
18—Chester, cattle, h., sh., pigs
18—Luton, cattle
19—Leicester, cattle, horses, sh.
20—Brampton, cattle, horses, sh.
20—Devizes, cattle, horses, sheep
21—Chesham
21—Louth, cattle
22—Pontypool, stock
22—Warminster
23—Leek, cattle, pleasure
24—Leigh, cattle
24—Lincoln
25—Loughborough, cattle
25—Rugby
27—Boroughbridge
28—Stamford, horses
29—Altrincham, cattle, general
29—Darlington, cattle, horses
29—Market Harborough
30—Cockermouth, cattle
30—Spalding, cattle, sheep

GARDEN KALENDAR FOR APRIL.

Kitchen Garden.

Sow main crops of Asparagus, Seakale, Beet, Salsify, Scorzonera, Skirret, Carrots, and Onions on heavy soils; also Peas, Beans, Turnips, Spinach, Celery, Cabbages, Savoys, and German Greens for succession. Sow Broccoli and Kidney Beans both in the second and in the last week; Cardoons not before the end of the month. Small salads should be sown twice or thrice during the month.

Plant Cauliflower, Cabbages, Artichokes, Seakale, Lettuce; and finish the planting of the main crops of Potatoes; and also of Strawberries. Propagate all sorts of pot herbs, and sweet herbs, such as Lavender, Marjoram, Hyssop, Balm, and Pennyroyal. Attend to the hoeing and thinning of Spinach, Onions, Turnips, and Carrots. Earth up Cabbages, Cauliflower, Peas, Beans, and early Potatoes. Stake up Peas; blanch Seakale and Rhubarb.

Fruit Trees.

No pruning or planting ought to be left unfinished till this period; stone fruits, in particular, are much injured by spring pruning. If Vines have been neglected, rubbing off the buds that are not wanted is now safer than pruning.

Forcing.

Continue the preparation of succession beds and pits for Cucumbers and Melons. Attend particularly to the cultivation of those in operation. Sow Gourds and Basil. Pot Tomatoes and Capsicums. Attend to the routine culture of the Pinery, giving water and air when necessary, keeping up the bottom-heat with linings and additions of new tan. In forcing-houses, from the variable state of the weather, considerable vigilance is required in giving air. Keep down red spider (Acarus) in the more advanced houses, by frequent syringings. Continue the usual operations of disbudding and thinning of fruit, and take care to keep up the proper temperature.

Greenhouse, &c.

Little artificial heat will be required except in frosty weather. An abundant supply of air and moisture is now necessary. The glass should be kept off the Alpine frames, except in frosty nights. Attend to the protection of Stage Auriculas from frost, as the flower buds are easily injured. Sow all sorts of tender annuals. Proceed with all necessary shiftings in the greenhouse and stove. Remove Camellias, when the flowers are over, to the stove or forcing houses, as they require heat to make them form healthy shoots and flower buds for next season. Propagate Chrysanthemums by dividing the roots, and all sorts of rare and fine plants, by cuttings or by grafting. Pot off tender annuals and cuttings of half-hardy greenhouse plants, which were put in to strike in the autumn or in February, for the use of the flower borders.

Flower Garden ana Shrubbery.

Sow main or succession crops of annuals of all sorts; half-hardy annuals in warm borders, or on slight hotbeds. Biennials and perennials should be sown before the middle of the month. Plant Tigridia pavonia and fine stocks. Finish the transplanting of herbaceous perennials by the end of the first week. Protect Stage Auriculas and Hyacinths from extremes of every description of weather, and Tulips from hoar frosts and heavy rains. Plant out tender deciduous trees and shrubs raised in pots. Remove part of the coverings of all tender shrubs and plants in the first week, and the remainder at the end of the month.

THE WEATHER AND MARKETS.

Barometer, highest, 30.22 inches, on 6th and 7th; lowest, 29.15 inches, on 1st; range, 1.07 inch.

Thermometer, highest, 68 deg., on 30th; lowest, 29 deg., on 1st and 6th; range, 39 deg. Mean temperature, 47.6, or 3.6 above average. Seven nights grass frosts under 30 deg.

Rainfall, 4.43 inches, or nearly 3 inches above average—the immense fall, 2.68 inches, on the 11th. This excessive reading is different from that of Mr Glaisher, who gives for the month of April 3.57 inches, being 1.87 above his mean average. The rain fell on fifteen days.

The mercury rose briskly from the commencement of the month until the night of the 6th, the weather during the whole time continued very changeable. During the latter part of the 6th, the wind fell light, and on the 7th an easterly breeze sprang up in place of the westerly current which had before prevailed. The barometer at the same time fell, causing fresh or slight south-easterly gales in all parts of the country, and heavy squalls in London on the 8th. The disturbance passed away over the Atlantic on the 9th, but for several days afterwards the barometer was very unsteady. The easterly breezes continued until the 12th, and were accompanied by cool, cloudy weather. On the night of the 10th, extremely heavy rain set in in London, lasting until about 2 P.M. next day, by which time 2¾ inches of rain had fallen. For the next few days the weather was tolerably fine, with warm southerly breezes, but on the 16th the barometer fell rather briskly, and the weather again became changeable, with a smart thunderstorm on the 17th. Showery weather continued for the next day or two, the brisk rise of the barometer on the 20th and 21st being but temporary, but on the 24th a considerable improvement took place. Bright, sunny weather was tempered by a cool northerly breeze, but the thermometer did not rise above 65 deg. on either day. The two last days were cloudy, and the month closed with unsettled weather.

The April markets were unsettled by politics, but kept value steadily. English Wheat average, 50/, 51/5, 51/11, and 51/8, thus being on the level of the last six months, within 2/ to 3/ transient weekly fluctuation. Generally, the harvest prospects were considered very favourable. January and February both, in England, were warmer than usual; March was rather colder, whilst April was warm, humid, and favourable to agriculture, although having a heavy rainfall, it was not continuously wet. Germany, Holland, Belgium, Austria, the Danubian Provinces, Spain, and France, and above all, America, sent promising reports. Only from India and Egypt spoke of exceptionally bad prospects. Lord Salisbury's Despatch sent up Wheat 2/ per qr. early in the month; the country got excited and asked 3/. America shipped in four weeks 357,000 qr. Wheat to the United Kingdom; the home supplies were 587,700 qr.; and of foreign Wheat and Flour about 984,000 qr., or nearly enough for current consumption.

MAY 31 Days

THE MOON'S CHANGES.

○ Full Moon, 6th, 6.12 a.m. | ● New Moon, 21st, 5.50 a.m.
☾ Last Quar., 13th, 2.36 a.m. | ☽ First Qr., 28th, 11.37 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			April	Feb.	Sept.	Aug.	June	
1	Th	Horse Show. Entry Books open	6	10	22	29	30	121
2	F	Clock after sun, 3m. 6s.	7	11	23	30	July 1	122
3	S	Mean temperature, 53° 74′	8	12	24	31	2	123
4	**S**	3 SUNDAY after EASTER	9	13	25	Sept. 1	3	124
5	M	Sun rises 4h. 28m., sets 7h. 27m.	10	14	26	2	4	125
6	Tu	*St John.* Mean rainfall, 21in...	11	15	27	3	5	126
7	W	Temperature evaporation, 49° 1′	12	16	28	4	6	127
8	Th	Half-Quarter Day	13	17	29	5	7	128
9	F	Law Easter Term ends	14	18	30	6	8	129
10	S	Pheasants and Partridges lay ...	15	19	Oct. 1	7	9	130
11	**S**	4 SUNDAY after EASTER	16	20	2	8	10	131
12	M	Wheat 52/1, 1878	17	21	3	9	11	132
13	Tu	Lowest night temp., 44° 94′	18	22	4	10	12	133
14	W	Fahrenheit born, 1686	19	23	5	11	13	134
15	Th	Corn Law carried H. C., 1846	20	24	6	12	14	135
16	F	Rainy days in month, 11	21	25	7	13	15	136
17	S	Peach flowers	22	26	8	14	16	137
18	**S**	*Rogation Sunday*	23	27	9	15	17	138
19	M	Sainfoin in bloom	24	28	10	16	18	139
20	Tu	Sun rises 4h. 3m., sets 7h. 49m.	25	Mar. 1	11	17	19	140
21	W	Horse Show. Entry Books close	26	2	12	18	20	141
22	Th	**Ascension Day**	27	3	13	19	21	142
23	F	Wasps appear	28	4	14	20	22	143
24	S	Birth of Queen Victoria, 1819...	29	5	15	21	23	144
25	**S**	SUNDAY after ASCENSION	30	6	16	22	24	145
26	M	*Augustine*	May 1	7	17	23	25	146
27	Tu	Barley 39/6, 1878	2	8	18	24	26	147
28	W	Sun's declination, 21° 29′ N......	3	9	19	25	27	148
29	Th	Restoration King Charles II. ...	4	10	20	26	28	149
30	F	Oxford Easter Term ends	5	11	21	27	29	150
31	S	Horses received, Islington Show	6	12	22	28	30	151

May.

1—Poole
1—Reading, cattle, horses, pleasure
1—Stockport, cattle, pleasure
2—Coventry, cattle, horses
2—Westhoughton, cattle, h., sheep
3—Bury, cattle, h. Boston, 4, 5, 6
3—Torrington, cattle
5, 6—Guildford, cattle, horses, sh.
5—Chorley, cattle, horses, sheep
5—Oakham, cattle, horses, sheep
6—Brecon, cattle, h., cheese, pl.
6—Lewes, cattle
6—Stamford, cattle, horses, sheep
7—Cheddar, cattle, h., sh., pigs
8—Wisbeach, cattle, horses
8, 9—Braintree, cattle, h., sh., hops
8, 9—Keighley, horses, sheep
10—Farnham, cattle, pleasure
10—Stroud, stock, pigs
12—Congleton, cattle, horses
12—Leicester, cattle, horses, sheep
12—Lymington, c., h., sh., p., pl.
12—Maidstone, cattle, horses, pl.
13—Andover, cattle, horses, cheese
13, 14—Ripon, cattle, general
14—Cockermouth, cattle
14—Rochdale, cattle
14—Swaffham, cattle
16—Egremont, cattle
17—Holbeach, horses
17—Wymondham, cattle, horses
17—Leek, cattle
19—Swindon, stock, pigs
21—Dorking, cattle, h., sh., pigs
21, 23—Wigan, cattle, horses
22—Hemel-Hempstead, cattle, sh.
22—Loughborough, cattle, pleasure
22—Scarborough, cattle
26—Thirsk, cattle, sheep
28—Cockermouth, cattle
29—Alston Moor, cattle, sheep
29—Sherborne, cattle, horses, sheep
29, 31—Ely, cattle, horses
30—Burton-on-Trent, cattle, pl.
30—Chester, cattle, h., sh., pigs
31—Carlisle, cattle, general

GARDEN KALENDAR FOR MAY.

Kitchen Garden.

Sow small salads every week; Radishes and Lettuces thrice during the month; Spinach once a fortnight; **Carrots** and Onions for late drawing; Kidney **Beans in the first** week and last fortnight; Peas and **Beans, Cabbages,** Brussels Sprouts, Borecole, Broccoli, **Savoys,** and German Greens for late crops. The **last sowing** of Cauliflower for the season should be **about the 20th.** Cardoons may be sown from the middle to the end of the month. Sow Pumpkins and Cucumbers on a warm border in the last week. Continue the various operations of hoeing and earthing-up the different crops.

Fruit Trees.

Disbud Peaches, Nectarines, and other early trees against the walls; also attend to the thinning of fruit. Give occasional washings with the engine to keep down insects. A little brown or Scotch snuff dusted over the trees after watering will effectually destroy greenfly. Pick caterpillars from Gooseberries and wall trees on their first appearance. Mulch, if not done before, all newly-planted fruit trees, watering abundantly in dry weather. Remove from Raspberries and Strawberries all suckers and runners that are not wanted.

Forcing.

Attend to the cultivation of the Melon and the Cucumber frames, regulating the air, heat, moisture, and shade according to the state of the plants; keeping them free from insects; thinning and training the Vines; also renewing the dung-linings when necessary. Plant Pumpkins and pickling Cucumbers, under hand-glasses, on dung-ridges, or in those frames that were used for early vegetables, most of which will be cleared off by the third or last week.

Greenhouse, &c.

Turn out hardy plants about the middle, and tender at the latter end, of the month. Sow tender annuals for succession, potting those sown at an earlier period, and removing them from the frames to the greenhouse or conservatory as they come into flower. Continue to propagate, by cuttings, the different kinds of plants that are now fit for that purpose, potting off such as are rooted. Remove Stage Auriculas to their summer quarters, in some shady place with a north exposure. The Alpine frame will require little more than a good supply of water, with occasional shiftings, and propagating a few of the early flowering plants. Sow some hardy annuals, and Ten-Week Stocks for late flowering.

Flower Garden.

Sow annuals for succession, biennials in the last week, in the nursery compartment, for planting out next year. Propagate by cuttings Dahlias, Pansies, Double Wallflowers, Rockets, Scarlet Lychnis, and Lobelias by dividing the roots. Plant out, during the first week, Dahlias, hardy Pelargoniums, Stocks, Calceolarias, and half-hardy annuals, protecting them from slight frosts. Protect Tulips from the mid-day sun, from rain, and winds. Remove the coverings from all tender plants in the open air, tying up plants where necessary.

Shrubbery.

Planting out of tender Evergreens from pots may be continued; but any other kind of transplanting will be carried on at considerable risk, except in very moist and cloudy weather. Proceed with the laying down of lawns and gravel walks, keeping the grass short.

THE WEATHER AND MARKETS.

The rainfall was 2.96 inches on twenty-two days, or rather more than an inch above the average; greatest fall, 0.38 inch, on the 8th.

Temperature highest in shade, 73 deg., on the 12th; lowest, 38 deg., on the 21st, and slight grass frost occurred on the 22d.

The barometer ranged 0.88 inch; highest, 30.17 inches, on the 30th; lowest, 29.29 inches on the 24th.

General character of month—wet and unsettled. The first days were fine and mild; from the 5th the winds, S.E., were fresh, with rain; then come 9th to 12th, warmer weather winds, strong from S.W. From the 20th the time was cold, windy, and wet, until the 30th and 31st. From this unseasonable May month many farmers feared another defective harvest. In Europe, saving England and France, the spring season has been reckoned favourable. The usual Wheat ear that appears in May was but rarely found. A continuance of wet and cold weather apprehended.

The markets kept value steady, English Wheat, 52/1, 52/4, 52/1, and 51/2, shewing a recovery of 3/ to 4/ from the lowest point in March; yet the tone of wholesale trade was dull and depressed under large American shipments, and the loading of many large steamers in the ports of South Eastern Europe, most of which, however, were destined for French and other Mediterranean ports. This month the Corn Trade was left to itself, after many months swaying about under the influence of daily telegrams from the seat of war in Eastern Europe, or from political centres. Foreign Wheat fell 2/ to 3/ in price, American and Russian 4/ to 5/. For the various sorts of Wheat shipping at Azov ports 38/ to 44/ is the quotation against 45/ to 50/ a month ago. The total Wheat shipments from Atlantic ports, were excessively large, 700,000 qr., a bulk exceeding all expectation at this period of the year. Algeria reported a good Barley crop. India quite failed as a source of present or expected future summer supply. France took great quantities of Russian and American corn.

The supplies of foreign Wheat and Flour in four weeks were 956,100 qr.; of English farmers' Wheat, about 656,600 qr., a total reckoned about adequate to current wants. At the end of the month, the Wheat supplies on passage curiously corresponded with that of former seasons:—

1874	1875	1876	1877	1878
1,205,000	1,253,000	1,244,000	1,002,000	1,266,000

giving a mean of about 1,200,000 qr.

The month closed with fair prospects of a peaceful settlement of the Eastern Question, and thus the tendency of grain prices was downwards.

JUNE 30 Days

THE MOON'S CHANGES.
○ Full Moon, 4th, 1.36 p.m. | ● New Moon, 19th, 8.20 p.m.
☾ Last Quar., 11th, 4.56 p.m. | ☽ First Quar., 27th, 5.56 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			May	Mar.	Oct.	Sept.	July	
1	S	Whit Sunday. *Pentecost*	7	13	23	29	31	152
2	M	Whit Mon. Islington Horse Sh.	8	14	24	30	Aug. 1	153
3	Tu	Rye fl. [opened—Hunters judg.	9	15	25	Oct. 1	2	154
4	W	Hurricane in Belgium, 1872......	10	16	26	2	3	155
5	Th	Trefoil flowers. *St Boniface* ...	11	17	27	3	4	156
6	F	Mean rainfall, 1.9 inches	12	18	28	4	5	157
7	S	Wheat—high. 50/4, low. 46/1, '78	13	19	29	5	6	158
8	S	Trin.Sun. Clock before sun, 1′17″	14	20	30	6	7	159
9	M	Sun rises, 3h. 46m. Field Pea fl.	15	21	31	7	8	160
10	Tu	Jupiter in conjunction with moon	16	22	Nov. 1	8	9	161
11	W	*St Barnabas.* Sun sets, 8h. 13m.	17	23	2	9	10	162
12	Th	Walnut fl. Mean temp., 59° 74′	18	24	3	10	11	163
13	F	Wheat ears ap., fl. 15th to 24th	19	25	4	11	12	164
14	S	Barley—high. 39/10, low. 30/9, '78	20	26	5	12	13	165
15	S	1 Sunday after Trinity	21	27	6	13	14	166
16	M	Rainy days in month, 11	22	28	7	14	15	167
17	Tu	*St Alban*	23	29	8	15	16	168
18	W	Battle of Waterloo, 1815	24	30	9	16	17	169
19	Th	Temperature evaporation, 54° 8′	25	31	10	17	18	170
20	F	Cambridge Easter Term ends...	26	April 1	11	18	19	171
21	S	Sun enters Cancer. Spring com.	27	2	12	19	20	172
22	S	2 Sunday after Trinity	28	3	13	20	21	173
23	M	Lowest night temp., 50° 61′......	29	4	14	21	22	174
24	Tu	Com. Poppy fl. *Midsummer Day*	30	5	15	22	23	175
25	W	Moon sets 10h. 56m. P.M..........	31	6	16	23	24	176
26	Th	G. White of Selborne died, 1793	June 1	7	17	24	25	177
27	F	Russians crossed Danube, 1877	2	8	18	25	26	178
28	S	Coronation Day. Lime tree fl.	3	9	19	26	27	179
29	S	3 Sun. af. Trinity. *St Peter*...	4	10	20	27	28	180
30	M	Royal A. S. Show begins.........	5	11	21	28	29	181

June.

1—Leicester
2—Cockermouth, cattle
2—Darlington, cattle, horses
2—St Ives, cattle, horses, sheep
3—Alford, sheep
3—Melton-Mowbray, cattle
3—Newmarket, cattle, horses, st.
3—Reigate, cattle
3—Uttoxeter
3—Carmarthen
3, 4—Sheffield, cattle, horses, sh.
4—Bedworth, cattle, pleasure
4—Wellingborough, cattle, pleasure
5—Birmingham, cattle, h., sheep
5, 6—Ripon, cattle, horses
6—Rugeley
6—Daventry
6—Tiverton, cattle, horses, sh., st.
9—Oakham, cattle, horses, sheep
10—Banbury
10—Nantwich, horses
12—Haverford West
12—Hemel-Hempstead, c., sh., st.
12—Leek, cattle
13—Aylesbury
13—Ross
14—Malton, cattle, sheep
16—Darlington, cattle, horses
16—Wexham
17—Taunton
17, 19—Bradford, cattle, h., pl.
19—Langbourne
19—Northampton, cattle, horses
20—Maidstone, cattle, horses, pl.
20—Kidderminster
20, 21—Horncastle, cattle, sheep
22—Chippenham
23—Selby, cattle, horses
23—Boroughbridge
23, 24—Stamford, cattle, horses
24—Farnham, cattle, pleasure
24, 26—Cambridge, cattle, h., pl.
25—Cockermouth, cattle
25—Newton-Abbot, cattle, horses
26—Bangor
28—Yeovil
29—Bath
29—Spalding, cattle, sheep
30—Stalybridge, cattle
30—Bridgenorth

GARDEN KALENDAR FOR JUNE.

Kitchen Garden.

Sow Peas and Beans for late crops. The kinds used for early crops are likewise best for this purpose. Sow salading every ten days, also Carrots and Onions for drawing young. In the beginning of the month, sow Endive for an early crop. In the first week sow Cardoons and Turnips for succession; and in the third week for a full autumn crop. Sow Scarlet and White Runners for a late crop; and in the middle of the month early Cabbages.

Plant full crops of Broccoli, Brussels Sprouts, Savoys, German Greens, and Leeks; ridge out early Celery, and successional crops of Cabbage and Cauliflower. In the first fortnight of the month plant out Cucumber plants in a warm border, placing hand-glasses over them; these will afford small Cucumbers for pickling. Draw and store winter Onions.

Fruit Trees.

Mulch and water fruit trees and Strawberries in dry weather, desisting from watering as soon as the fruit begins to ripen. Net over Cherry trees, to protect the fruit from birds. Destroy insects by frequent washings, and directing Tobacco-smoke against them, or by strewing snuff (the fine powder of Tobacco) over them. In the first week, plant out Tomatoes in vacant spaces along the bottom of a south wall.

Forcing.

Proceed with planting Melons and Cucumbers raised from seeds and cuttings, for late crops. Keep up, by linings, the necessary temperature for ripening of the fruit. Continue the cultivation of the Pinery stated for last month; but if you wish very large-sized fruit, and do not care about preserving suckers, remove the whole suckers from the stems and roots, and apply heat and water in abundance. Shift suckers and succession plants in the beginning and middle of the month.

Vines, Peaches, &c., may have the same treatment as stated last month. Little water and a good deal of air must be given to those houses where the fruit is beginning to ripen. Those in which the fruit is past, ought to be constantly under a system of thorough ventilation.

The greenhouse will now be occupied with tender greenhouse plants and annuals, and the more hardy plants from the stove, for here these last will remain longer in flower. Shift, re-pot, and propagate all fine plants, perennials, biennials, or annuals, and cuttings of all sorts that are desirable. Sow fragrant and showy annuals, to flower in pots during winter.

Flower Garden.

Carefully take up bulbs and tuberous roots, and dry them in the shade before you remove them to the storeroom. Fill up with annuals and greenhouse plants those beds from which the bulbs and roots have been raised. After this season, keep always a reserve of annuals in pots, or planted on beds or thin layers of well-rotted hotbed dung, from which they are easily removed with balls, to fill up any blanks which may occur in the borders or parterre. Sow perennials, if neglected last month, to be planted out in spring. Lay and pipe Carnations and Pinks in the end of the month. Pay particular attention to the staking and tying up of every plant that requires it, especially young Dahlias, as they are easily destroyed by high winds; in dry weather water abundantly, as many plants are much improved by it, especially Dahlias. Attend to the dressing and cleaning of borders and walks, and the mowing of grass lawns.

THE WEATHER AND MARKETS.

Barometer, highest, 30.24 inches, on 6th; lowest, 29.48 inches, on 11th; range, 0.76 inch.

Thermometer in shade, highest, 76 deg., on 26th; lowest, 48 deg., on 14th and 15th; range, 28 deg.

Rainfall, 2.51 inches, falling on thirteen days; greatest fall on any one day, 0.71 on 16th.

The month of June opened with fair, cool, and tolerably dry weather, but after the 3d the conditions became more cloudy and showery. The barometer rose quickly on the 4th and 5th, but fell quite as rapidly on the 7th and 8th, and the weather from that time until about the 20th continued very unsettled and showery. Several thunderstorms occurred during that period, those of the 8th, 16th, and 19th being accompanied by heavy local showers, and that of the 19th by a severe hailstorm in the south-western districts of the Metropolis. About the 18th and 19th, however, a gradual but decided rise in the barometer began to take place. With the exception of the violent thunderstorm which passed over London on Sunday, the 23d, the weather for some days had been quiet and settled. The thermometer had gradually risen, and very high maxima had been attained, the highest of all (91 deg.) being registered on Wednesday, the 27th. On the 26th, however, a cool south-easterly breeze sprang up, and the highest reading on the 28th did not amount to more than 85.

The markets of this month were influenced by very heavy foreign Wheat and Flour supplies, 1,204,400 qr. in five weeks, with small deliveries from farmers, 453,800 qr., and the English average price of Wheat fell 4/ per qr., the official returns being 50/4, 49/, 47/10, 46/9, and 46/1. Barley also varied considerably, from 39/10 to 35/3, and Oats kept stationary at about 26/. The very bad weather of May, that appeared to materially reduce harvest prospects, was succeeded by a warm June, and again the crops looked hopefully well, and went through a capital blooming period in these islands; in France, the fields were much less favoured. America and Southern Europe had now good crops assured. The Peace Congress was also a great element on the side of buyers. The estimates of the American Wheat surplus, from increased area and yield of the winter sown corn, put the quantity at 15,000,000 to 20,000,000 qr. Harvest began well in Algeria and Spain; in fact, the month of June gave us the double assurance of peace and of plenty, and New York shippers hurried forward their offers of the new Wheat crop for July-August shipment at 41/ per 480 lb. In Paris, the Exhibition displayed an unrivalled collection of grain samples from various countries, and so brought home to visitors the knowledge that "all the world" was an open corn market. Certainly French merchants became accustomed to using American Wheat, which they liked, and began to import to an unprecedented extent as mistrust of their own Wheat fields extended under disastrous storms of wind and rain, accompanied by thunder and lightning that devastated the most promising crops.

JULY 31 Days

THE MOON'S CHANGES.

○ Full Moon, 3d, 9.38 p.m. | ● New Moon, 19th, 9.6 a.m.
☾ Last Quar., 11th, 8.54 a.m. | ☽ First Quar., 26th, 10.36 a.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			June	April	Nov.	Oct.	Aug.	
1	Tu	Mean temperature, 62° 47′	6	12	22	29	30	182
2	W	*Visit. B. Virgin.* Sun in Apogee	7	13	23	30	31	183
3	Th	Bat. of Sadowa, '66. Dog days com	8	14	24	31	Sept. 1	184
4	F	American decl. of Indep., 1776	9	15	25	Nov. 1	2	185
5	S	Oxford Trinity Term ends	10	16	26	2	3	186
6	S	4 SUN. af. TRIN. Old Midsr. Day	11	17	27	3	4	187
7	M	Tirnova captured by Russians, '77	12	18	28	4	5	188
8	Tu	Mean rainfall, 2.7 inches	13	19	29	5	6	189
9	W	Wheat—high. 46/, low. 44/5, '77	14	20	30	6	7	190
10	Th	Sun's altitude, 60° 43′	15	21	Dec. 1	7	8	191
11	F	Lowest night temp., 53° 68′......	16	22	2	8	9	192
12	S	Temperature evaporation, 57″ 5′	17	23	3	9	10	193
13	S	5 SUNDAY after TRINITY	18	24	4	10	11	194
14	M	Potato fl. Rye harvest begins	19	25	5	11	12	195
15	Tu	*St Swithun.* Weather period...	20	26	6	12	13	196
16	W	Outbrk Cattle Pl., Beth. Grn, '77	21	27	7	13	14	197
17	Th	Franco-Prussian War beg., 1870	22	28	8	14	15	198
18	F	Ecl. of Sun, invis. at Greenwich	23	29	9	15	16	199
19	S	Hop flowers. Poultry moults...	24	30	10	16	17	200
20	S	6 SUN. af. TRINITY. *St Margaret*	25	May 1	11	17	18	201
21	M	Buckwheat flowers	26	2	12	18	19	202
22	Tu	Barley—high. 37/4, low. 27/2, '78	27	3	13	19	20	203
23	W	Defeat of Turks on Lom, 1877	28	4	14	20	21	204
24	Th	Window Tax repealed, 1851 ...	29	5	15	21	22	205
25	F	*St James.* Amer. Ry. strike, '77	30	6	16	22	23	206
26	S	Atlantic Cable laid, 1866	July 1	7	17	23	24	207
27	S	Swifts begin to dep., last seen 31st	2	8	18	24	25	208
28	M	Rainy days in mnth, 12. Saturn sta	3	9	19	25	26	209
29	Tu	Wilberforce died, 1833............	4	10	20	26	27	210
30	W	Two days' attack on Plevna rep, '77	5	11	21	27	28	211
31	Th	Defeat of Russians at Eski Saghra	6	12	22	28	29	212

July.

1—Hereford
2—Leek, cattle
3—Shrewsbury
5—Chester—cattle, h., sheep, pigs
5—Gloucester, cattle
5—Leicester, cattle, horses, sheep
5—Torrington, cattle
5—Bedford, cattle, pigs
5—Bodmin, cattle, sheep
6—Wakefield
7—Oakham, cattle, horses, sheep
7—Uppingham, cattle, horses
7—Taunton
10—Peterborough, cattle, horses
10—York
10, 11—Leeds, horses, pleasure
11—Burnley, cattle, horses
12—Scarborough, cattle
12—Congleton, cattle, fruit
16—Swaffham, lambs
18—Scarborough, cattle
18—Sherborne, cattle, h., sh.
18—Warrington, cattle
19—Maidstone, cattle, h., pl.
20—Frome
23, 24—Honiton, cattle, h., sh.
25—Liverpool, horses, stock
25—Reading, cattle, h., cherry
25—Wisbeach, horses
26—Cambridge, sheep, lambs
26—Sherborne, cattle, h, sh.
26—Melksham, cattle, horses, sh.
26—Leek, cattle
30, 31—Bolton, cows, horses
31—Alford, lambs
31—Alfreton, horses, cows, sh.
31—Uxbridge, cattle, horses, sh.

ROYAL AGRICULTURAL SOCIETY'S SHOW, LONDON, JUNE 30 TO JULY 7.

GARDEN KALENDAR FOR JULY.

Kitchen Garden.

This is often a dry month, and one of the first needs of growing vegetables—water—must be provided in such plenty as thoroughly to saturate the earth. Celery, Peas, Asparagus, Cauliflower, Cabbage, Broccoli, Turnips, Lettuces, can hardly make way against a July sun without such copious waterings; or, if they do, they will prove stringy, tough, and worthless. Nine-tenths of most vegetables are sheer water, and water they must have. With water in plenty, July vegetables are as good as any; without, they are often not worth eating.

Sow Peas weekly till after the middle of the month, when the last crop for the season may be put in. In the last week, sow Yellow Turnip for a full winter crop, and Spinach for an early winter crop; Endive, for autumn and winter crops in the beginning and end of the month; also successional crops of Lettuce and small salads. Early Cabbages for Coleworts should be sown in the first week.

Plant full crops of Celery and Celeriac about the middle and end of the month; late crops of Broccoli, Cauliflower, and Coleworts in the last week. Gather and dry medical and pot herbs; also propagate such by slips and cuttings.

Fruit Trees.

Continue the summer pruning and training of all wall and espalier-rail trees, with the destruction of insects. All heavy or over-abundant crops of fruit ought to be thinned, as otherwise not only are the size and quality of the fruit deteriorated, but the trees exhausted and injured. Plant Strawberries in pots, for forcing next winter. Propagate different sorts of fine fruit trees by budding on other trees, or on prepared stocks.

Forcing.

Attend to the pruning of Melons and Cucumbers, giving air and water, renewing linings, &c. Go on with the usual cultivation of the Pinery, but withhold water from the plants when the fruit begins to ripen. Have the old plants with suckers on them put into a brisk bottom-heat, giving proper supplies of water; this will increase their size very much, and materially shorten the period of their coming into fruit. The forcing houses ought to have the same treatment as stated for last month.

Greenhouse.

Little alteration will take place in the culture and management from that given for last month, necessary attention being paid to potting, shifting, and putting in cuttings, and giving abundance of water to the potted plants, both in the house and out-of-doors.

Flower Garden and Shrubbery.

Take up the remainder of the tuberous roots, such as Anemones and Ranunculus, finishing by the end of the first week; fill up their places, and any vacancies that may have occurred, with annuals from the reserve ground. Propagate all the finer herbaceous plants that have gone out of flower by means of cuttings and slips; also select Roses and American Shrubs by layering, budding, or cuttings. Go on with the laying, piping, and striking of Carnations, Pinks, Pansies, and the different varieties of sub-perennial plants, as Sweet William, Pink, Catchfly, Double Rocket, and Double Wallflower, in hand-glasses, or in shaded situations. Attend to the staking and tying up of Dahlias and strong herbaceous plants. Great attention must now be paid to cleaning in every department, weeds springing up after every shower.

THE WEATHER AND MARKETS.

Barometer, highest, 30.36 inches, on 31st; lowest, 29.68 inches, on 24th; range, 0.68 inch.

Thermometer in shade, 88 deg., on 19th; lowest, 46 deg., on 30th; range, 42 deg.

Rainfall, on ten days, total 0.60 inch; 0.20 falling on 26th.

The month of July presented many important changes of weather. The first half of the month was on the whole cloudy and rather cool, although a few fine warm days were experienced about the 5th and 6th, on which occasions the thermometer rose to 77 deg. in the shade. On the 13th, the mercury began to rise steadily until it reached a level of 30.3 in. and upwards on the 16th, 17th, 18th, and 19th. The weather cleared considerably with the rising glass, the greatest heat registered being on the 19th, when the thermometer rose to 88 deg. in the shade. The weather continued fine until about the 23d, on which day the barometer began to fall rather briskly, and although pressure recovered and reached as high a point as it attained during the previous hot weather, the sky was generally cloudy, and the weather quite cool.

The July markets witnessed a further depression of prices as the English harvest prospects improved. Value on the averages fell from 46/ to 44/8, 44/5, and 44/7 for Wheat. July was warm and much drier than usual in England, and harvest commenced well at the end of the month. A very large grass crop had been secured, which made observers mistrust the ultimate out-turn of the corn crop. But at this date, Mr T. C. Scott, writing to the *Times* and THE FARMER, anticipated an average yield of Wheat, a deficient one of Barley, although the latter corn had greatly improved under the tropical sunshine of this month.

Supplies were very much below those of June, being only—foreign 893,700 qr., home 330,300 qr., in four weeks, the returns for June including five weeks' supplies. The falling off in imports was probably owing to the continued heavy purchases made by the Continent. California and many of the Northern States secured a large crop in this month. The Treaty of Berlin, and the cession of Cyprus to England, seemed to promise a new and stable order of affairs in the fertile East of Europe. The Russian grain shipments were moderately large, but nearly all the bulk was taken by French and other Continental buyers. Nothing but the steady buying of the French millers prevented the Wheat market collapsing to a far more serious extent than it did. India quite fell behind all calculation as to export—the Empire had nothing to send. Freights were exceedingly low, and accordingly diminished prices. Bread sold at 5d. to 9d. per loaf, Oatmeal at 16/ per cwt., Maize fell to 26/ per qr., Flour to 29/ for Norfolk sorts, 36/ for London households, and Oats to 16/6 per qr. The Wheat on passage was only 713,000 qr., having declined 200,000 qr. from the 1st of July, and 500,000 qr. from the 1st of June.

AUGUST 31 Days

THE MOON'S CHANGES.

○ Full Moon 2d, 7.12 a.m. | ● New Moon 17th, 8.11 p.m.
☾ Last Quar., 10th, 2.9 a.m. | ☽ First Quar., 24th, 3.12 p.m.
○ Full Moon, 31st, 6.58 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			July	May	Dec.	Nov.	Sept.	
1	F	*Lammas Day*....................	7	13	23	29	30	213
2	S	Mean temp. 61° 9′; sun rises......	8	14	24	30	Oct. 2	214
3	**S**	8 SUNDAY after TRINITY [4h. 26m.	9	15	25	Dec. 1	2	215
4	M	Bank Holiday. Mercury south,	10	16	26	2	3	216
5	TU	Sun sets, 7h. 42m. [1h. 40m. P.M.	11	17	27	3	4	217
6	W	Duke of Edinburgh born, 1844	12	18	28	4	5	218
7	TH	*Name of Jesus*	13	19	29	5	6	219
8	F	Long Vacation commences	14	20	30	6	7	220
9	S	Mercury stationary	15	21	31	7	8	221
10	**S**	9 SUN. aft. TRINITY. *St Lawrence*	16	22	Jan. 1	8	9	222
11	M	Half Quarter. Dog days end...	17	23	2	9	10	223
12	TU	Grouse Shooting begins	18	24	3	10	11	224
13	W	*Old Lammas Day*..................	19	25	4	11	12	225
14	TH	First book printed, 1457	20	26	5	12	13	226
15	F	Reform Bill of 1867 passed	21	27	6	13	14	227
16	S	Battle of Gravelotte, 1870	22	28	7	14	15	228
17	**S**	10 SUNDAY after TRINITY	23	29	8	15	16	229
18	M	Wonderful meteor, 1783	24	30	9	16	17	230
19	TU	Venus, greatest brilliancy.........	25	31	10	17	18	231
20	W	Venus conj. moon. Blackcock Sh.	26	June 1	11	18	19	232
21	TH	Clock before sun, 2m. 58s. [com.	27	2	12	19	20	233
22	F	Wheat, 45/2, 1878..................	28	3	13	20	21	234
23	S	Rainy days in month, 11	29	4	14	21	22	235
24	**S**	11 SUN aft. TRIN. *St Bartholomew*	30	5	15	22	23	236
25	M	Mean rainfall, 2.4 inches	31	6	16	23	24	237
26	TU	Temperature evaporation, 57° 6′	Aug. 1	7	17	24	25	238
27	W	Uranus in conjunction with sun	2	8	18	25	26	239
28	TH	*St Augustine*........................	3	9	19	26	27	240
29	F	Barley, 42/1, 1878..................	4	10	20	27	28	241
30	S	Length of day, 13h. 41m.	5	11	21	28	29	242
31	**S**	12 SUNDAY after TRINITY.........	6	12	22	29	30	243

August.

1—Uxbridge
2—Newark
2—Northwich, cattle, general
2—Winchester, sheep
3—Daventry
4—Wednesbury
4, 5—Stamford, cattle, horses
5—Abingdon
5—Doncaster, cattle, horses, stock
5—Lindfield, cattle, horses, sheep
5—Northampton, sheep
5—Thirsk, cattle, sheep
5—Trowbridge
5, 6—Altrincham, cattle, general
6—Edgware, cattle
6—Hexham, cattle, horses, sh., st.
7—Chester, cattle, h., sh., pigs
8—Shepton Mallet
11—Oakham, cattle, horses, sheep
11—Warminster
12—Horncastle, horses
12—Loughborough, cattle
12—Wisbeach, cattle
12—York
12—Newcastle-on-Tyne
14—Banbury
15—Worcester
15—Oswestry
20—Chorley, cattle, horses, sheep
21—Horncastle
21—Melton-Mowbray, cattle
21—Stroud, pigs, stock
22—Ipswich
22—Marlborough
23—Skipton, horses
23—Alford, sheep
25—Bedworth
26—Carlisle, cattle, general
26—Hinckley, cattle, horses, sheep
26—Northampton, sheep
26—Romsey, cattle, h., sh., pigs
27—Ashford, lambs
28—Spalding, cattle, horses, sheep
28—Coventry

GARDEN KALENDAR FOR JULY.

Kitchen Garden.

This is often a dry month, and one of the first needs of growing vegetables—water—must be provided in such plenty as thoroughly to saturate the earth. Celery, Peas, Asparagus, Cauliflower, Cabbage, Broccoli, Turnips, Lettuces, can hardly make way against a July sun without such copious waterings; or, if they do, they will prove stringy, tough, and worthless. Nine-tenths of most vegetables are sheer water, and water they must have. With water in plenty, July vegetables are as good as any; without, they are often not worth eating.

Sow Peas weekly till after the middle of the month, when the last crop for the season may be put in. In the last week, sow Yellow Turnip for a full winter crop, and Spinach for an early winter crop; Endive, for autumn and winter crops in the beginning and end of the month; also successional crops of Lettuce and small salads. Early Cabbages for Coleworts should be sown in the first week.

Plant full crops of Celery and Celeriac about the middle and end of the month; late crops of Broccoli, Cauliflower, and Coleworts in the last week. Gather and dry medical and pot herbs; also propagate such by slips and cuttings.

Fruit Trees.

Continue the summer pruning and training of all wall and espalier-rail trees, with the destruction of insects. All heavy or over-abundant crops of fruit ought to be thinned, as otherwise not only are the size and quality of the fruit deteriorated, but the trees exhausted and injured. Plant Strawberries in pots, for forcing next winter. Propagate different sorts of fine fruit trees by budding on other trees, or on prepared stocks.

Forcing.

Attend to the pruning of Melons and Cucumbers, giving air and water, renewing linings, &c. Go on with the usual cultivation of the Pinery, but withhold water from the plants when the fruit begins to ripen. Have the old plants with suckers on them put into a brisk bottom-heat, giving proper supplies of water; this will increase their size very much, and materially shorten the period of their coming into fruit. The forcing houses ought to have the same treatment as stated for last month.

Greenhouse.

Little alteration will take place in the culture and management from that given for last month, necessary attention being paid to potting, shifting, and putting in cuttings, and giving abundance of water to the potted plants, both in the house and out-of-doors.

Flower Garden and Shrubbery.

Take up the remainder of the tuberous roots, such as Anemones and Ranunculus, finishing by the end of the first week; fill up their places, and any vacancies that may have occurred, with annuals from the reserve ground. Propagate all the finer herbaceous plants that have gone out of flower by means of cuttings and slips; also select Roses and American Shrubs by layering, budding, or cuttings. Go on with the laying, piping, and striking of Carnations, Pinks, Pansies, and the different varieties of sub-perennial plants, as Sweet William, Pink, Catchfly, Double Rocket, and Double Wallflower, in hand-glasses, or in shaded situations. Attend to the staking and tying up of Dahlias and strong herbaceous plants. Great attention must now be paid to cleaning in every department, weeds springing up after every shower.

THE WEATHER AND MARKETS.

Barometer, highest, 30.36 inches, on 31st; lowest, 29.68 inches, on 24th; range, 0.68 inch.

Thermometer in shade, 88 deg., on 19th; lowest, 46 deg., on 30th; range, 42 deg.

Rainfall, on ten days, total 0.60 inch; 0.20 falling on 26th.

The month of July presented many important changes of weather. The first half of the month was on the whole cloudy and rather cool, although a few fine warm days were experienced about the 5th and 6th, on which occasions the thermometer rose to 77 deg. in the shade. On the 13th, the mercury began to rise steadily until it reached a level of 30.3 in. and upwards on the 16th, 17th, 18th, and 19th. The weather cleared considerably with the rising glass, the greatest heat registered being on the 19th, when the thermometer rose to 88 deg. in the shade. The weather continued fine until about the 23d, on which day the barometer began to fall rather briskly, and although pressure recovered and reached as high a point as it attained during the previous hot weather, the sky was generally cloudy, and the weather quite cool.

The July markets witnessed a further depression of prices as the English harvest prospects improved. Value on the averages fell from 46/ to 44/8, 44/5, and 44/7 for Wheat. July was warm and much drier than usual in England, and harvest commenced well at the end of the month. A very large grass crop had been secured, which made observers mistrust the ultimate out-turn of the corn crop. But at this date, Mr T. C. Scott, writing to the *Times* and THE FARMER, anticipated an average yield of Wheat, a deficient one of Barley, although the latter corn had greatly improved under the tropical sunshine of this month.

Supplies were very much below those of June, being only—foreign 893,700 qr., home 330,300 qr., in four weeks, the returns for June including five weeks' supplies. The falling off in imports was probably owing to the continued heavy purchases made by the Continent. California and many of the Northern States secured a large crop in this month. The Treaty of Berlin, and the cession of Cyprus to England, seemed to promise a new and stable order of affairs in the fertile East of Europe. The Russian grain shipments were moderately large, but nearly all the bulk was taken by French and other Continental buyers. Nothing but the steady buying of the French millers prevented the Wheat market collapsing to a far more serious extent than it did. India quite fell behind all calculation as to export—the Empire had nothing to send. Freights were exceedingly low, and accordingly diminished prices. Bread sold at 5d. to 9d. per loaf, Oatmeal at 16/ per cwt., Maize fell to 26/ per qr., Flour to 29/ for Norfolk sorts, 36/ for London households, and Oats to 16/6 per qr. The Wheat on passage was only 713,000 qr., having declined 200,000 qr. from the 1st of July, and 500,000 qr. from the 1st of June.

AUGUST 31 Days

THE MOON'S CHANGES.
○ Full Moon 2d, 7.12 a.m. | ● New Moon 17th, 8.11 p.m.
☾ Last Quar., 10th, 2.9 a.m. | ☽ First Quar., 24th, 3.12 p.m.
○ Full Moon, 31st, 6.58 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			July	May	Dec.	Nov.	Sept.	
1	F	*Lammas Day*........................	7	13	23	29	30	213
2	S	Mean temp. 61° 9′; sun rises......	8	14	24	30	Oct. 2	214
3	**S**	8 SUNDAY after TRINITY [4h. 26m.	9	15	25	Dec. 1	2	215
4	M	Bank Holiday. Mercury south,	10	16	26	2	3	216
5	TU	Sun sets, 7h. 42m. [1h. 40m. P.M.	11	17	27	3	4	217
6	W	Duke of Edinburgh born, 1844	12	18	28	4	5	218
7	TH	*Name of Jesus*	13	19	29	5	6	219
8	F	Long Vacation commences	14	20	30	6	7	220
9	S	Mercury stationary	15	21	31	7	8	221
10	**S**	9 SUN. aft. TRINITY. *St Lawrence*	16	22	Jan. 1	8	9	222
11	M	Half Quarter. Dog days end...	17	23	2	9	10	223
12	TU	Grouse Shooting begins	18	24	3	10	11	224
13	W	*Old Lammas Day*..................	19	25	4	11	12	225
14	TH	First book printed, 1457	20	26	5	12	13	226
15	F	Reform Bill of 1867 passed	21	27	6	13	14	227
16	S	Battle of Gravelotte, 1870	22	28	7	14	15	228
17	**S**	10 SUNDAY after TRINITY	23	29	8	15	16	229
18	M	Wonderful meteor, 1783	24	30	9	16	17	230
19	TU	Venus, greatest brilliancy.........	25	31	10	17	18	231
20	W	Venus conj. moon. Blackcock Sh.	26	June 1	11	18	19	232
21	TH	Clock before sun, 2m. 58s. [com.	27	2	12	19	20	233
22	F	Wheat, 45/2, 1878..................	28	3	13	20	21	234
23	S	Rainy days in month, 11	29	4	14	21	22	235
24	**S**	11 SUN aft. TRIN. *St Bartholomew*	30	5	15	22	23	236
25	M	Mean rainfall, 2.4 inches	31	6	16	23	24	237
26	TU	Temperature evaporation, 57° 6′	Aug. 1	7	17	24	25	238
27	W	Uranus in conjunction with sun	2	8	18	25	26	239
28	TH	*St Augustine*.......................	3	9	19	26	27	240
29	F	Barley, 42/1, 1878..................	4	10	20	27	28	241
30	S	Length of day, 13h. 41m.	5	11	21	28	29	242
31	**S**	12 SUNDAY after TRINITY.........	6	12	22	29	30	243

August.

1—Uxbridge
2—Newark
2—Northwich, cattle, general
2—Winchester, sheep
3—Daventry
4—Wednesbury
4, 5—Stamford, cattle, horses
5—Abingdon
5—Doncaster, cattle, horses, stock
5—Lindfield, cattle, horses, sheep
5—Northampton, sheep
5—Thirsk, cattle, sheep
5—Trowbridge
5, 6—Altrincham, cattle, general
6—Edgware, cattle
6—Hexham, cattle, horses, sh., st.
7—Chester, cattle, h., sh., pigs
8—Shepton Mallet
11—Oakham, cattle, horses, sheep
11—Warminster
12—Horncastle, horses
12—Loughborough, cattle
12—Wisbeach, cattle
12—York
12—Newcastle-on-Tyne
14—Banbury
15—Worcester
15—Oswestry
20—Chorley, cattle, horses, sheep
21—Horncastle
21—Melton-Mowbray, cattle
21—Stroud, pigs, stock
22—Ipswich
22—Marlborough
23—Skipton, horses
23—Alford, sheep
25—Bedworth
26—Carlisle, cattle, general
26—Hinckley, cattle, horses, sheep
26—Northampton, sheep
26—Romsey, cattle, h., sh., pigs
27—Ashford, lambs
28—Spalding, cattle, horses, sheep
28—Coventry

GARDEN KALENDAR FOR AUGUST.

Kitchen Garden.

Sow Winter and Spring Spinach in the beginning and about the middle of the month; Parsley and Winter Onions, for a full crop, in the first week; Cabbages, Cauliflower, Savoys, and German Greens about the middle of the month, for planting out in spring; Lettuce in the first and last week; small salads occasionally; Black Spanish, Red and White Radish, for winter crops.

All winter vegetables, such as Broccoli, Kale, Sprouts, Savoys, and Summer Cauliflower, and Walcheren Broccoli, must be well attended to and liberally treated. Manure-watering, surface-scarifying with the hoe, earthing up, and the complete destruction of all weeds, are the chief cultural attentions needed by such stuff during the months. Leeks, Lettuces, and Endive will grow fast and crisp under the same general treatment.

Plant and earth up Celery and Endive. Plant Strawberries. A few Coleworts may still be put in.

Fruit Garden.

Proceed in the training and regulation of summer shoots of all fruit trees, as directed for the last three months. Attend to the thinning of the fruit where necessary. Mat up, in dry weather, Gooseberry and Currant bushes, to preserve the fruit till late in the autumn. Every exertion must now be used by the gardeners to preserve the ripening fruit on the walls from insects, and to destroy wasp nests.

Forcing.

The same routine of cultivation in hotbeds and pits may be proceeded in as stated for last month. Sow and propagate by cuttings, in the beginning of the month, Cucumbers, to be afterwards grown in hot-water pits, or in boxes in the front of the Pine stove, for a winter crop. In the Pinery, most of the fruit will be cut by the middle of the month, when a general shifting of succession plants should take place, as also a potting of suckers; but these will be strengthened by being allowed to remain on the old plants until the end of this month. In the forcing houses, where the crops are past, part of the sashes may be removed so as to permit thorough ventilation.

Greenhouse.

Attend to the propagation of all sorts of greenhouse plants by cuttings, and to the replacing in the greenhouse and stoves the more tender species, by the end of the month in ordinary seasons, but in wet weather in the second week. Sow half-hardy annuals, as Clarkia, Schizanthus, Coreopsis, &c., to flower during winter. Also begin to propagate the various species of the half-hardy greenhouse plants, noticed under February, for decorating the flower garden in the following summer.

Flower Garden and Shrubbery.

Sow in the second and the last week, on a warm border of a light sandy soil, with an east aspect, for planting out in spring, Clarkia pulchella, pulchella alba, Gilia capitata, Collomia coccinea, Coreopsis tinctoria, Œnothera Lindleyana, roseo-alba, Romanzovii, Collinsia verna, grandiflora, bicolor, Eutoca viscida, Leptosiphon densiflorus, Nemophila insignis, Eschscholtzia californica, &c. Sow Auricula and Primula seeds in pots and boxes. Propagate all sorts of herbaceous plants by rooted slips; lay Chrysanthemums; in the first week take off layers of Carnations, Pinks, and Pansies. Transplant Evergreens in moist weather, about the end of the month, and propagate them by layers and cuttings.

THE WEATHER AND MARKETS.

Barometer, highest, 30.34 inches, on 1st; lowest, 29.21 inches, on 30th; range, 1.13 inch.

Thermometer in shade, highest, 81 deg., on 5th; lowest, 51 deg., on 18th; range, 30 deg.

Rainfall, on sixteen days, total 6.02 inches, or 4.5 inches in excess of average.

The month of August has been, on the whole, extremely showery and unsettled. A few fine days were experienced about the 6th and 7th, and also about the middle of the month, but with the exception of these brief intervals, the weather has been most unfavourable.

Thunderstorms have prevailed on many occasions, but the most severe ones were those of the 4th and 24th. On the former occasion, the storm was remarkable for its lengthy duration, and also for the tropical downpour of rain; on the 24th also, the showers were extremely heavy, and the lightning remarkably vivid and destructive. The month concludes with unsettled weather.

Throughout August, English Wheat was steadily maintained at the low rates to which July had reduced it. The averages were 44/10, 44/1, 44/2, 45/2, and 45/8. Compared with a year ago, 64/11, this was a decline of about 20/ per qr., a very depressing fact to the farmer, who, however, saw his crops blessed with abundant sunshine that added millions of pounds sterling to their value. The Wheat breadth under cultivation was found to be 3,218,579 acres in Great Britain, a small increase on the previous year. Mr Caird estimated the yield at a full average, and that this would leave 11,500,000 qr. for consumption. The *Agricultural Gazette*, out of 198 returns, had 47 above average, 118 average, 36 under average. These results agreed with those established by THE FARMER in a survey of the crops in July. A survey made of the French crops in this month convinced THE FARMER that the Wheat yield would be woefully short, and demand an import of 5,000,000 to 6,000,000 qr. This estimate checked the declining tendency of prices in England. The weather, too, was capricious, and violent storms broke the harvest in two parts, the first being a fine period during which a moiety of Wheat in the earlier counties was well secured; and the second part only gave alternate opportunities of gathering over a protracted period, when much grain was greatly deteriorated in these islands, and almost rendered valueless in France. The supplies of August were moderate—home 478,600 qr., foreign 748,300 qr. in four weeks. New English Wheat made 54/ for white, 48/ for red for the first samples, but soon declined 2/ to 3/. Damp and light samples at once appeared worth only 42/. At the end of August, the position of the markets was rather better than at the commencement, as exaggerated crop prospects were modified. The rainfall had been nearly 3 inches over an average, and falling on six days more than usual.

SEPTEMBER 30 Days

THE MOON'S CHANGES.

☾ Last Quar., 8th, 8.4 p.m. | ☽ First Quar., 22d, 9.19 p.m.
● New Moon, 16th, 5.57 a.m. | ○ Full Moon, 30th, 9.17 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Aug.	June	Jan.	Dec.	Oct.	
1	M	Partridge Shoot. beg. *St Giles*	7	13	23	30	31	244
2	Tu	Bat of Sedan, '70. Sun rises, 5h 17m	8	14	24	31	Nov. 1	245
3	W	Death of M. Thiers, 1877.........	9	15	25	Jan. 1	2	246
4	Th	Fall of French Empire, 1870 ...	10	16	26	2	3	247
5	F	Turkish victory on Lom, 1877	11	17	27	3	4	248
6	S	Sun sets, 6h. 34m	12	18	28	4	5	249
7	**S**	13 SUNDAY after TRINITY.........	13	19	29	5	6	250
8	M	*Birth Blessed Virgin Mary*......	14	20	30	6	7	251
9	Tu	Fair at Ashford, Kent	15	21	31	7	8	252
10	W	Sebastopol taken, 1855............	16	22	Feb. 1	8	9	253
11	Th	Clock after sun, 3m. 27s.	17	23	2	9	10	254
12	F	Night 11h. 11m. long	18	24	3	10	11	255
13	S	Salmon fishing Scotland ends ...	19	25	4	11	12	256
14	**S**	14 SUN aft. TRINITY. *Holy Rood*	20	26	5	12	13	257
15	M	Buck Hunting begins	21	27	6	13	14	258
16	Tu	Wheat 45/, 1878	22	28	7	14	15	259
17	W	Desperate fighting Plevna, 1877	23	29	8	15	16	260
18	Th	Plant Spring Bulbs	24	30	9	16	17	261
19	F	Temperature evap., 53° 9′.........	25	July 1	10	17	18	262
20	S	Battle of Alma, 1854	26	2	11	18	19	263
21	**S**	15 SUN. after TRIN. *St Matthew*	27	3	12	19	20	264
22	M	Autumnal Equinox	28	4	13	20	21	265
23	Tu	Mean rainfall, 2.5 inches	29	5	14	21	22	266
24	W	Death M. Le Verrier, 1877......	30	6	15	22	23	267
25	Th	Soc. Sc. Cong.—Caird on Agri.	31	7	16	23	24	268
26	F	Mean temperature, 57.3	Sept. 1	8	17	24	25	269
27	S	Rainy days in month, 12	2	9	18	25	26	270
28	**S**	16 SUNDAY after TRINITY.........	3	10	19	26	27	271
29	M	*Michaelmas.* Lord Mayor elect.	4	11	20	27	28	272
30	Tu	*St Jerome.* Saturn conj. moon	5	12	21	28	29	273

September.

1—Bristol
4—Crewkerne, cattle, horses, sheep
5—Chester, cattle, h., sh., pigs
5, 7—Barnet, horses
6—Peterborough, rams
6—Northallerton
8—Evesham, cheese, rams
8—Oakham, cattle, horses, sheep
8—Cardiff
8—Stourbridge
9—Blandford, cattle, horses, sheep
9—Watford
11—Blackburn
11—Horncastle, sheep, lambs, foals
11—Wareham, cattle, h., sh., pigs
12—Salisbury
13—Maldon
13—Frome
15—Grimsby
17—Alford, cattle, sheep
17—Congleton, cattle, horses
17—Holbeach, horses
17—Newton-Abbot, cattle, horses
18—Bury, cattle, horses
18—Egremont, cattle
19—Carlisle, cattle
19—Glastonbury, cattle, h., sh.
19—Northampton, sheep
19—Worcester
19—Abington
20—Lewes, cattle, horses, sheep
20—Reading, cattle, horses, cheese
20—Evesham
23—Daventry
23—Swindon
25—Haverford West
25—Spalding, cattle, horses, sheep
27—Alston-Moor, cattle, sheep
27, 29—Derby
28—Gloucester, cattle
28—Lewes, cattle, horses, sheep
29—Melton-Mowbray, cattle
29—Uxbridge, cattle
29—Stamford
30—Burton-on-Trent, cattle, h.

GARDEN KALENDAR FOR SEPTEMBER.

Kitchen Garden.

Sow a few small salads for late crops; Lettuce, Parsley, and Spinach, if not done last month, for spring crops. Plant Endive and Lettuce. If Broccoli be too strong or tall to withstand the winter, lift them and lay them nearly up to the neck in the earth. Lift Onions, and lay them out to win on a dry border or gravel walk. Lift Potatoes and store them.

Forcing.

Take care that late crops of Melons and Cucumbers be not injured by damping—from getting too much water and too little air. In the Pinery, the usual routine of cultivation may be carried on; in the first week take off and pot all strong suckers, if not done in the middle of last month; the remainder may be taken off at the end of the month, and planted in old tan in a frame or pit prepared for that purpose; in this way they will be found to keep much better over the winter, and to be better supplied with roots than if they had been potted, which ought never to be done after this season. Expel damp, and assist the ripening of late crops of Grapes and Peaches with fires during the day. Prune early Grape Vines and Peaches.

Greenhouse, Conservatory, &c.

All repairs of painting or glazing ought to be finished by the first week, as many plants will require to be taken into the houses by the 20th of the month. In ordinary seasons, comparatively few greenhouse plants can be trusted in the open air after this period. Pelargoniums and half-hardy greenhouse plants may be kept in frames or in sheltered situations until the end of October. Pot Hyacinths, Polyanthus, Narcissus, and Tulips for forcing. The same attention must be given to the propagation of half-hardy greenhouse plants (see February) as directed for last month. Remove Stage Auriculas to the winter frames about the middle of the month; also tender Alpine plants, keeping the glass-frames shut in wet weather. Early in this month replace in the stove all succulents that may have been kept in the greenhouse or in the open air during the summer months.

Fruit Trees, &c.

Finish the summer pruning and training. Assist the maturing of the fruit, and, what is equally important, the ripening of the young wood for next year of Peaches and Nectarines on hot walls, with fires during the day. Gather and lay up in the fruit-room, with care, the autumnal sorts of Apples and Pears. In the first week, plant Strawberries for a main crop next season.

Flower Garden, &c.

Sow in the beginning of this month all half-hardy annuals stated for last month, if not done at that time. Sow also the different species of Primula, and the seeds of all such plants, for, if sown in spring, they seldom come up the same season, but if sown in September or October they vegetate readily in the succeeding spring. Continue the propagation of herbaceous plants, taking off the layers of Carnations, Pinks, and Pansies, and putting them into a nursery-bed for the winter. Pot Chrysanthemum layers by the end of the month. Keep all Dahlias and tall herbaceous plants properly staked and tied up, as they are very liable to be broken by high winds at this season. The same attention must be given to the cleaning and dressing of this department as directed for the former months. Plant Evergreens; make layers, and put in cuttings of most of the hard-wooded sorts of shrubby plants about the middle and end of the month.

THE WEATHER AND MARKETS.

Barometer, highest, 30.30 inches, on 2d; lowest, 29.53 inches, on 15th; range, 0.77 inch.

Thermometer in shade, highest, 75 deg., on 7th and 11th; lowest, 39 deg., on 24th; range, 36 deg.

Rainfall, on eleven days, total 0.82 inch, or 1.89 inch less than average; 0.29 inch fell on 18th.

The month of September has been, on the whole, very fine in London and its neighbourhood, though much more unsettled in the western and northern parts of the Kingdom. The barometrical changes were slight and gradual during the first part of the month, but on the 15th a very sudden fall occurred, succeeded on the following day by as sudden a recovery. The weather during these days was unsettled, showers of rain falling on the 15th, while the wind rose to the force of a gale on the evening of that day, and continued rough and squally throughout the 16th. Rather heavy rain occurred on the 18th, but no important change in the barometer occurred until the 22d, when another sudden fall set in, lasting until midday on the 23d. Rain again accompanied this fall in the mercury, but during the next few days, the barometer rose, and the weather became fine. Temperature was high on several occasions in the early part of the month, the maximum on 7th and 11th reaching 75 deg., but towards the close, the thermometer has been much lower.

September rather below the mean temperature, and drier than in most seasons, allowed the later harvest fields to be cleared, and gave opportunities of thrashing out, so that the markets tumbled down from 45/4 the first week to 45/, 43/2, and 41/5 in the last. Wheat, too, was being very largely shipped in America, so that the quantity afloat was 1,530,000 qr. against 588,288 qr. on the 1st of August. This rapid delivery of new grain quite disorganized business, as the Wheat was good in quality as well as large in quantity. However, the extreme lowness of value was considered a solid base for the new corn campaign, and the Continent exhibited so large a want, that the great American shipments got absorbed, and went into consumption without stocks accumulating. France also came into the English market and took several cargoes of red Wheat, which relatively was 6/ and 7/ below the French currencies. This season saw the aggregate shipments from Atlantic ports rise to the height of 1,898,000 qr. in four weeks, out of which the Continent took 1,172,000 qr., Havre, Dunkirk, Antwerp, and Bordeaux passing, by a long way, the orders of Liverpool, London, and Glasgow. The supplies were, to the United Kingdom from abroad, in four weeks, 1,111,700 qr., from farmers 857,000, together, nearly 2,000,000 qr., or about 250,000 qr. above the four weeks' requirements. During September, the Wheat supply headed and kept in front of demand. Flour fell to 27/ per sack for the cheapest marks, and at 28/ many country millers failed to find custom; London brands made 31/ to 38/ per sack. Bread, after an outcry from the public, was generally reduced 1d. per loaf, 6d. to 8d. being the usual price.

SEPTEMBER 30 Days

THE MOON'S CHANGES.

☾ Last Quar., 8th, 8.4 p.m. | ☽ First Quar., 22d, 9.19 p.m.
● New Moon, 16th, 5.57 a.m. | ○ Full Moon, 30th, 9.17 a.m.

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			Mare	Cow	Ewe	Sow	Bitch	
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2	Tu	Bat of Sedan, '70. Sun rises, 5h 17m	8	14	24	31	Nov. 1	245
3	W	Death of M. Thiers, 1877.........	9	15	25	Jan. 1	2	246
4	Th	Fall of French Empire, 1870 ...	10	16	26	2	3	247
5	F	Turkish victory on Lom, 1877	11	17	27	3	4	248
6	S	Sun sets, 6h. 34m	12	18	28	4	5	249
7	S	13 SUNDAY after TRINITY.........	13	19	29	5	6	250
8	M	*Birth Blessed Virgin Mary*......	14	20	30	6	7	251
9	Tu	Fair at Ashford, Kent	15	21	31	7	8	252
10	W	Sebastopol taken, 1855............	16	22	Feb. 1	8	9	253
11	Th	Clock after sun, 3m. 27s.	17	23	2	9	10	254
12	F	Night 11h. 11m. long	18	24	3	10	11	255
13	S	Salmon fishing Scotland ends ...	19	25	4	11	12	256
14	S	14 SUN aft. TRINITY. *Holy Rood*	20	26	5	12	13	257
15	M	Buck Hunting begins	21	27	6	13	14	258
16	Tu	Wheat 45/, 1878	22	28	7	14	15	259
17	W	Desperate fighting Plevna, 1877	23	29	8	15	16	260
18	Th	Plant Spring Bulbs	24	30	9	16	17	261
19	F	Temperature evap., 53° 9′.........	25	July 1	10	17	18	262
20	S	Battle of Alma, 1854	26	2	11	18	19	263
21	S	15 SUN. after TRIN. *St Matthew*	27	3	12	19	20	264
22	M	Autumnal Equinox	28	4	13	20	21	265
23	Tu	Mean rainfall, 2.5 inches	29	5	14	21	22	266
24	W	Death M. Le Verrier, 1877......	30	6	15	22	23	267
25	Th	Soc. Sc. Cong.—Caird on Agri.	31	7	16	23	24	268
26	F	Mean temperature, 57.3	Sept. 1	8	17	24	25	269
27	S	Rainy days in month, 12	2	9	18	25	26	270
28	S	16 SUNDAY after TRINITY.........	3	10	19	26	27	271
29	M	*Michaelmas.* Lord Mayor elect.	4	11	20	27	28	272
30	Tu	*St Jerome.* Saturn conj. moon	5	12	21	28	29	273

September.

1—Bristol
4—Crewkerne, cattle, horses, sheep
5—Chester, cattle, h., sh., pigs
5, 7—Barnet, horses
6—Peterborough, rams
6—Northallerton
8—Evesham, cheese, rams
8—Oakham, cattle, horses, sheep
8—Cardiff
8—Stourbridge
9—Blandford, cattle, horses, sheep
9—Watford
11—Blackburn
11—Horncastle, sheep, lambs, foals
11—Wareham, cattle, h., sh., pigs
12—Salisbury
13—Maldon
13—Frome
15—Grimsby
17—Alford, cattle, sheep
17—Congleton, cattle, horses
17—Holbeach, horses
17—Newton-Abbot, cattle, horses
18—Bury, cattle, horses
18—Egremont, cattle
19—Carlisle, cattle
19—Glastonbury, cattle, h., sh.
19—Northampton, sheep
19—Worcester
19—Abington
20—Lewes, cattle, horses, sheep
20—Reading, cattle, horses, cheese
20—Evesham
23—Daventry
23—Swindon
25—Haverford West
25—Spalding, cattle, horses, sheep
27—Alston-Moor, cattle, sheep
27, 29—Derby
28—Gloucester, cattle
28—Lewes, cattle, horses, sheep
29—Melton-Mowbray, cattle
29—Uxbridge, cattle
29—Stamford
30—Burton-on-Trent, cattle, h.

GARDEN KALENDAR FOR SEPTEMBER.

Kitchen Garden.

Sow a few small salads for late crops; Lettuce, Parsley, and Spinach, if not done last month, for spring crops. Plant Endive and Lettuce. If Broccoli be too strong or tall to withstand the winter, lift them and lay them nearly up to the neck in the earth. Lift Onions, and lay them out to win on a dry border or gravel walk. Lift Potatoes and store them.

Forcing.

Take care that late crops of Melons and Cucumbers be not injured by damping—from getting too much water and too little air. In the Pinery, the usual routine of cultivation may be carried on; in the first week take off and pot all strong suckers, if not done in the middle of last month; the remainder may be taken off at the end of the month, and planted in old tan in a frame or pit prepared for that purpose; in this way they will be found to keep much better over the winter, and to be better supplied with roots than if they had been potted, which ought never to be done after this season. Expel damp, and assist the ripening of late crops of Grapes and Peaches with fires during the day. Prune early Grape Vines and Peaches.

Greenhouse, Conservatory, &c.

All repairs of painting or glazing ought to be finished by the first week, as many plants will require to be taken into the houses by the 20th of the month. In ordinary seasons, comparatively few greenhouse plants can be trusted in the open air after this period. Pelargoniums and half-hardy greenhouse plants may be kept in frames or in sheltered situations until the end of October. Pot Hyacinths, Polyanthus, Narcissus, and Tulips for forcing. The same attention must be given to the propagation of half-hardy greenhouse plants (see February) as directed for last month. Remove Stage Auriculas to the winter frames about the middle of the month; also tender Alpine plants, keeping the glass-frames shut in wet weather. Early in this month replace in the stove all succulents that may have been kept in the greenhouse or in the open air during the summer months.

Fruit Trees, &c.

Finish the summer pruning and training. Assist the maturing of the fruit, and, what is equally important, the ripening of the young wood for next year of Peaches and Nectarines on hot walls, with fires during the day. Gather and lay up in the fruit-room, with care, the autumnal sorts of Apples and Pears. In the first week, plant Strawberries for a main crop next season.

Flower Garden, &c.

Sow in the beginning of this month all half-hardy annuals stated for last month, if not done at that time. Sow also the different species of Primula, and the seeds of all such plants, for, if sown in spring, they seldom come up the same season, but if sown in September or October they vegetate readily in the succeeding spring. Continue the propagation of herbaceous plants, taking off the layers of Carnations, Pinks, and Pansies, and putting them into a nursery-bed for the winter. Pot Chrysanthemum layers by the end of the month. Keep all Dahlias and tall herbaceous plants properly staked and tied up, as they are very liable to be broken by high winds at this season. The same attention must be given to the cleaning and dressing of this department as directed for the former months. Plant Evergreens; make layers, and put in cuttings of most of the hard-wooded sorts of shrubby plants about the middle and end of the month.

THE WEATHER AND MARKETS.

Barometer, highest, 30.30 inches, on 2d; lowest, 29.53 inches, on 15th; range, 0.77 inch.

Thermometer in shade, highest, 75 deg., on 7th and 11th; lowest, 39 deg., on 24th; range, 36 deg.

Rainfall, on eleven days, total 0.82 inch, or 1.89 inch less than average; 0.29 inch fell on 18th.

The month of September has been, on the whole, very fine in London and its neighbourhood, though much more unsettled in the western and northern parts of the Kingdom. The barometrical changes were slight and gradual during the first part of the month, but on the 15th a very sudden fall occurred, succeeded on the following day by as sudden a recovery. The weather during these days was unsettled, showers of rain falling on the 15th, while the wind rose to the force of a gale on the evening of that day, and continued rough and squally throughout the 16th. Rather heavy rain occurred on the 18th, but no important change in the barometer occurred until the 22d, when another sudden fall set in, lasting until midday on the 23d. Rain again accompanied this fall in the mercury, but during the next few days, the barometer rose, and the weather became fine. Temperature was high on several occasions in the early part of the month, the maximum on 7th and 11th reaching 75 deg., but towards the close, the thermometer has been much lower.

September rather below the mean temperature, and drier than in most seasons, allowed the later harvest fields to be cleared, and gave opportunities of thrashing out, so that the markets tumbled down from 45/4 the first week to 45/, 43/2, and 41/5 in the last. Wheat, too, was being very largely shipped in America, so that the quantity afloat was 1,530,000 qr. against 588,288 qr. on the 1st of August. This rapid delivery of new grain quite disorganized business, as the Wheat was good in quality as well as large in quantity. However, the extreme lowness of value was considered a solid base for the new corn campaign, and the Continent exhibited so large a want, that the great American shipments got absorbed, and went into consumption without stocks accumulating. France also came into the English market and took several cargoes of red Wheat, which relatively was 6/ and 7/ below the French currencies. This season saw the aggregate shipments from Atlantic ports rise to the height of 1,898,000 qr. in four weeks, out of which the Continent took 1,172,000 qr., Havre, Dunkirk, Antwerp, and Bordeaux passing, by a long way, the orders of Liverpool, London, and Glasgow. The supplies were, to the United Kingdom from abroad, in four weeks, 1,111,700 qr., from farmers 857,000, together, nearly 2,000,000 qr., or about 250,000 qr. above the four weeks' requirements. During September, the Wheat supply headed and kept in front of demand. Flour fell to 27/ per sack for the cheapest marks, and at 28/ many country millers failed to find custom; London brands made 31/ to 38/ per sack. Bread, after an outcry from the public, was generally reduced 1d. per loaf, 6d. to 8d. being the usual price.

OCTOBER 31 Days

THE MOON'S CHANGES.
☾ Last Quar., 8th, 1.43 p.m. | ☽ First Quar., 22d, 6.18 a.m.
● New Moon, 15th, 3.9 p.m. | ○ Full Moon, 30th, 2.10 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Sept.	July	Feb.	Jan.	Nov.	
1	W	*St Remy.* Pheas. Shoot. begins	6	13	22	29	30	274
2	Th	Nottingham Goose Fair	7	14	23	30	Dec. 1	275
3	F	Sun rises, 6h. 6m	8	15	24	31	2	276
4	S	Mars in conjunction with moon	9	16	25	Feb. 1	3	277
5	**S**	17 SUNDAY after TRINITY	10	17	26	2	4	278
6	M	*St Faith.* Dividends payable...	11	18	27	3	5	279
7	Tu	Sun sets, 5h. 23m..............	12	19	28	4	6	280
8	W	Chicago burned down, 1871......	13	20	Mar. 1	5	7	281
9	Th	Clock after sun, 12m. 42s.........	14	21	2	6	8	282
10	F	Great Fair at Weyhill	15	22	3	7	9	283
11	S	Old Michaelmas Day	16	23	4	8	10	284
12	**S**	18 SUNDAY after TRINITY	17	24	5	9	11	285
13	M	Fieldfares arrive	18	25	6	10	12	286
14	Tu	Fire Insurance due	19	26	7	11	13	287
15	W	*St Teresa.* Farningham Fair...	20	27	8	12	14	288
16	Th	Mean temperature, 50° 4′.........	21	28	9	13	15	289
17	F	Fox Hunting begins................	22	29	10	14	16	290
18	S	*St Luke.* Stock Exch. panic, 1876	23	30	11	15	17	291
19	**S**	19 SUNDAY after TRINITY.........	24	31	12	16	18	292
20	M	Battle of Navarino, 1827	25	Aug. 1	13	17	19	293
21	Tu	Battle of Trafalgar, 1805	26	2	14	18	20	294
22	W	Blantyre explos., 200 killed, '77	27	3	15	19	21	295
23	Th	Mean rainfall, 2.8 inches	28	4	16	20	22	296
24	F	Long Vacation ends	29	5	17	21	23	297
25	S	Battle of Balaclava, 1854..........	30	6	18	22	24	298
26	**S**	20 SUNDAY after TRINITY.........	Oct. 1	7	19	23	25	299
27	M	Sir Stafford Northcote b., 1818	2	8	20	24	26	300
28	Tu	*Sts Simon and Jude.* Jupiter sta.	3	9	21	25	27	301
29	W	Hare Hunting begins	4	10	22	26	28	302
30	Th	Rainy days in month, 13	5	11	23	27	29	303
31	F	*Hallowe'en.* Sept. game cert. exp.	6	12	24	28	30	304

October.

1, 3—Peterborough, c., pleasure
1, 6—Nottingham, c., cheese, pl.
2—Birmingham, cattle, h., sh.
2—Liskeard, cattle, honey, pl.
2—Lymington, c., h., sh., pigs, pl.
2—Ripon, sheep
2, 3—Braintree, c., h., sh., hops
3—Tiverton, cattle, h., sh., pigs
7—Daventry, cattle
8—Selby, cattle, horses
9, 10—Leicester, cattle, h., sh.
10—Chester, cattle, h., sh., pigs
10—Torrington, cattle
11—Glastonbury, cattle, sheep
11—Holbeach, stock, pleasure
11—Hull, cattle
11—Keswick, cattle, sheep
11—Scarborough, cattle
11—St Ives, cattle, horses, sheep
11—Uxbridge, cattle
11, 12—Malton, cattle, sheep
11—Bedford, cattle, pigs
11—Westhoughton, cattle, h., sh.
13—Sherborne, cattle, horses, sh.
14, 15—Bolton, cows, horses
15—Oakham, cattle, horses, sheep
17, 18—Ashborne, sheep
18—Alston-Moor, cattle, sheep
18—Brampton, cattle, sheep
20—Chichester, horses, pleasure
20—Devizes, cattle, horses, sheep
20, 29—Gainsborough, c., h., sh., pl.
21—Ashbourne, horses
21—Chorley, cattle, horses, sheep
23—Stockport, cattle, horses, sheep
23—Winchester, sheep
23, 25—Ely, cattle, horses
24—Melton-Mowbray, cattle
25—Tonbridge, cattle, horses, sh.
27—Daventry, cattle, stock, sheep
28—Evesham, rams, cheese
28, 29—Burton-on-Trent, c., h.
28, 29—Horncastle, horses, sheep
28, 29—Thirsk, cattle, sheep
28, 29—Wigan, cattle, horses
29—Cheddar, cattle, h., sh., pigs
29—Wellingborough, cattle, pl.

GARDEN KALENDAR FOR OCTOBER.

Kitchen Garden.

Sow small salads and Radishes in the first week; Mazagan and Marshall's Dwarf Beans and early frame Peas (Warwick variety) in the last week. If the winter prove mild they will be somewhat earlier than those sown next month or in January. Prepare and make up Mushroom beds.

Plant early Cabbages in close rows for spring use. A bed of Cauliflowers in the last week, to receive the protection of a three-light frame; or, at any rate, plant Cauliflower at the bottom of a high wall or edge in a sheltered situation. Earth up Celery and Cardoons.

Store Potatoes, Beet, Salsify, Scorzonera, Skirret, Carrots, Parsnips, by the end of the month.

Hoe and thin Winter Spinach and late Turnips. Destroy weeds, which grow very fast during this month.

Fruit Garden.

Such fruit trees as have dropped their leaves may be transplanted. Protect Fig trees, if the weather prove frosty, as soon as they have cast their leaves. Cover late crops of Grapes on hot walls with woollen nets or mats, to prevent injury from frost. Store and lay up very carefully during the month all sorts of Apples and Pears, the longest-keeping sorts not before the end of the month, if the weather is mild; a part of them may be placed in a close cellar.

Forcing.

Assist hotbeds and pits with fresh linings, to keep up the declining heat of such as have not ripened their crops. Late Vineries and Peach houses will still require the application of fire-heat to ripen the wood; for if this be not accomplished, the next crop will be inferior both in quantity and quality. Give abundance of air to the Pinery in good weather, gradually lowering the heat. Prune and dress early Vines and Peaches; clean and repair the forcing houses and their flues; continue the preparation and formation of Mushroom beds.

Greenhouse.

Replace all sorts of greenhouse plants at an early period, as many of them are often much injured by cold rains and frosty mornings at this season. Fill the pits with pots of Stocks, Mignonette, and hardy annuals for planting out in spring, along with many of the more hardy sorts of greenhouse plants. The whole ought to be thoroughly ventilated, except in frosty weather. Water sparingly. Begin to force Roses, Hyacinths, and a few other bulbs for winter and early spring decoration.

Flower Garden.

Sow a few sorts of hardy annuals in a frame, or on a sheltered border, for spring use, as directed for August.

Plant the greater part of the common border bulbs about the end of the month, with a few Anemones for early flowering. Transplant strong plants of biennials and perennials to their final situation.

Protect Alpine plants, Stage Auriculas, and Carnations with glass frames; half-hardy greenhouse plants, such as Fuchsias, &c., about the end of the month, with coverings of Broom or Spruce Fir, preferring the latter. Take up, dry, and store Dahlias and Tigridia tubers in the end of the month; pot Lobelias from the open borders.

Transplant all sorts of hardy Evergreens and shrubs, noticing in dry soils to give abundance of water. Put in cuttings of all sorts of Evergreens. Attend to the removal of decayed plants, leaves, and rubbish from the walks and borders.

THE WEATHER AND MARKETS.

October 1877 was quite fine and cold during the first week. On the 7th and 8th a fresh gale blew at our N.E. stations. On the 9th, and several days following, the winds were westerly, which rose to a severe gale on the 15th all over the country, although ushered in by an exceedingly bright warm day. The last fortnight of the month was mild and unsettled, with frequent rain after 20th, and S.W. gales on 21st, 27th, and 29th, the last being a general storm.

Barometer, highest, 30.68 inches on 6th, lowest 29.22 inches on 25th.

Thermometer, highest in shade, 66 deg. on 14th; lowest, 30 deg. on 18th, with 9 deg. on grass. There were several grass frosts in the first fortnight.

Rainfall, total 1.73 inch, or 0.6 inch below average. This fell on fifteen days, the greatest fall in one day being 0.44 inch on the 25th.

October allowed much field-work to be satisfactorily performed, and the ploughs busy in all the counties made a favourable seed-bed, so that wheat-sowing last autumn was well advanced.

The short crop of Wheat had but little influence on market opinion. As, with our estimated requirements, 13,000,000 qr., that quantity was considered as assured with the help of the very large and very fine crops of the United States.

The markets of October were but scantily supplied with home-grown Wheat; harvest was late in the Northern Counties, and thrashing was deferred longer than usual. The quality and condition of samples were unsatisfactory. The imports assumed very large proportions, especially from Atlantic ports, but California fell far behind her usual autumn shipments. The letters from India were promising, a good seed time in that Empire having been enjoyed. Stocks increased moderately during this month, supplies exceeding current consumption. The computed quantities received in four weeks were— Home Wheat supplies 867,000 qr, foreign Wheat and Flour 1,178,000 qr.; the English averages were 55/11, 52/2, 52/9, 53/7. The quotations in Suffolk were 60/ for white, 56/ for red Wheat. Barley 40/ to 49/. Beans 42/. Suffolk Flour 38/ to 43/. The decline on Wheat since August was 10/, notwithstanding the acknowledged deficiency of the harvest yield. Saxonska Wheat made 54/ to 56/. American Wheat 54/to 58/. Californian 61/to 62/. Maize realised 30/for American, 36/ for Black Sea sorts. The quantity of Wheat afloat was about 1,500,000 qr. Although blockaded in the Black Sea, Russia forwarded considerable supplies *via* her northern ports and Prussia.

NOVEMBER 30 Days

THE MOON'S CHANGES.

☾ Last Quar., 7th, 5.55 a.m. | ☽ First Quar., 20th, 6.55 p.m.
● New Moon, 14th, 0.38 a.m. | ○ Full Moon, 28th, 8.57 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Oct.	Aug.	Mar.	Mar.	Dec.	
1	S	*All Saints.* Stock Exch. Holiday	7	13	25	1	31	305
2	S	21 SUNDAY aft. TRIN. *All Souls*	8	14	26	2	Jan. 1	306
3	M	Michaelmas Law Sittings begin	9	15	27	3	2	307
4	TU	Sun rises, 7h. 1m..................	10	16	28	4	3	308
5	W	Earthquake in New York, 1877	11	17	29	5	4	309
6	TH	*St Leonard*	12	18	30	6	5	310
7	F	First Eng. Gazette publish., 1665	13	19	31	7	6	311
8	S	Biggleswade Fair. Pr. Wales b.,	14	20	April 1	8	7	312
9	S	22 SUNDAY after TRINITY. [1841	15	21	2	9	8	313
10	M	Ld Mayor's Day. Municip. elec.	16	22	3	10	9	314
11	TU	*St Martin*	17	23	4	11	10	315
12	W	Destructive Gale, 1877............	18	24	5	12	11	316
13	TH	Meteoric period......................	19	25	6	13	12	317
14	F	Sun sets, 4h. 11m	20	26	7	14	13	318
15	S	Rainy days in month, 12	21	27	8	15	14	319
16	S	23 SUNDAY after TRINITY.........	22	28	9	16	15	320
17	M	*St Hugh of Lincoln*.........[1877	23	29	10	17	16	321
18	TU	Boston Horse Fair. Fall of Kars	24	30	11	18	17	322
19	W	Clock after sun, 14m. 27s.........	25	31	12	19	18	323
20	TH	*St Edmund.* Wind period	26	Sept. 1	13	20	19	324
21	F	*Presentation B. V. Mary*	27	2	14	21	20	325
22	S	*St Cecilia.* York Fair............	28	3	15	22	21	326
23	S	24 SUN. aft. TRIN. *St Clement*	29	4	16	23	22	327
24	M	Destructive Gale, 1877............	30	5	17	24	23	328
25	TU	*St Katharine*........................	31	6	18	25	24	329
26	W	Jupiter sq. to sun	Nov. 1	7	19	26	25	330
27	TH	Finches congregate	2	8	20	27	26	331
28	F	Mean temperature, 43° 6′.........	3	9	21	28	27	332
29	S	Bank rate 4 per cent., 1877	4	10	22	29	28	333
30	S	ADVENT SUNDAY. *St Andrew*	5	11	23	30	29	334

November.

1.—Coventry, cattle, horses
1.—Poole
3—Stamford, horses
4—Brecon, c, h, cheese, pleasure
5—Portland, horses, pigs, stock
5—Stalybridge, cattle, sheep
5—Swaffham, cattle, pleasure
6—Alston-Moor, cattle, h., sheep
6—Northampton, sheep
6—Oakham, cattle, horses, sheep
6—Ripon, sheep
7—Rochdale, cattle
7, 8—Leeds, horses, pleasure
7, 8—Stamford, cattle, h., sheep
7, 9—Keighley, horses, stock
8—Alford, cattle, sheep, pleasure
8—Blandford, cattle, horses, sheep
8—Carlisle, cattle
8—Newbury
8—Newmarket, cattle, h., stock
8—Romsey, cattle, h., sh., pigs
8—Hexham, cattle, h., sh., stock
10—Ashby
10—Farnham, cattle, pleasure
11—Liverpool, horses, stock
11—Newark
12—Newton-Abbot, cattle, horses
12—Penrith, cattle
13—Loughborough, cattle, pleasure
14—York
15—Cambridge, sheep, lambs
15—Doncaster, cattle, horses, stock
17—Bedford, cattle, pigs
17, 18—Andover, cattle, sheep
20—Boston
20—Darlington
21—Chester, cattle, h., sh., pigs
22—Altrincham, cattle, general
22—Congleton, cattle, horses
22—Louth, cattle
22—Ripon, cattle, horses
22, 23—Guildford, cattle, h., sheep
25—Frome
27—Doncaster
27—Kidderminster
28—Gloucester, cattle
28—Northampton, cattle
29—Ashbourne, cattle
30—Warrington

GARDEN KALENDAR FOR NOVEMBER.

Kitchen Garden.

The great business of the month is with the soil. As early as possible, every vacant space of ground should be trenched or dug up. The surface should be left as rough and lumpy as possible. Simply invert the earth, and by no means smash it with the spade after it is turned over. In summer digging, the usual practice is to bang, cut, or drive the upturned earth into fineness. All this must be carefully avoided now. Even the spadeful of earth must be turned gently, for fear of breaking it down in the process. There is a twofold reason for all this care—to expose as much surface to the air as possible, and prolong the season of roughness to the utmost limits. If soil be broken fine when inverted in winter, it soon consolidates into hardness. Snows and rains batter it down, and it might almost as well have been unturned. But left rough, every rain-drop pierces, every sunbeam warms, every fog and dew nourishes it; and it is gradually mellowed by natural forces into the finest tilth.

This is a good time to apply manures. If the manure cannot be got on before the rain has made the ground sticky, the wheeling must be deferred till the frost sets in.

It is likewise a good time for draining gardens. No garden should have stagnant water within 5 feet of the surface.

Sow early frame Peas and Mazagan Beans, for an early crop. Protect Endive, Celery, Artichoke, Seakale, with stable-litter or Ferns; mulch Asparagus with hotbed dung; take up Endive, late Cauliflower, early Broccoli, and Lettuces, and lay them in an open shed, or in old Cucumber and Melon pits, which will protect them from frost, and afford a supply during winter.

Fruit Garden.

Plant all sorts of fruit trees in fine weather, giving an abundant supply of water to settle the earth about the roots. Commence and carry on the various operations of pruning and nailing.

Forcing.

In hotbeds and pits keep up the requisite degree of heat by frequent additions to the linings. Cucumbers and Pines, on hotbeds, will require more than ordinary attention, to prevent them damping off from too much moisture. Where hot-water pipes are employed for heating, the necessary temperature and dryness are much more under the control of the gardener. Force Asparagus, Rhubarb, and Seakale in the Mushroom house or pits for a supply at Christmas. Attend to the forcing of Mushrooms. In the forcing houses, prune and train the trees; dig and dress the borders of those houses in which this operation has not already been done.

Greenhouse, &c.

All hardy greenhouse plants must now be properly protected, by being replaced in the greenhouse or in pits. Give abundance of air in fresh weather, only applying heat to keep out the frost during the night or to expel the damp, with the assistance of air through the day; remove all decayed or injured leaves, watering only such plants as require it. Commence the forcing of Rhododendrons, Kalmias, Roses Hyacinths, Tulips, in the stove or in pits.

Flower Garden, &c.

Plant dried tubers of border flowers, but the finer sorts had better be deferred till spring. Plant deciduous trees and shrubs as long as the weather continues favourable. Dig and dress flower borders and shrubberies.

THE WEATHER AND MARKETS.

The weather of November 1877 was very stormy, wet, and unsettled, temperature very high, with gales from the south and west. There was a remarkable absence of the usual November fogs. On the 10th, very severe southerly gales swept over the whole of the British Islands, and were accompanied by heavy rain. These gales were followed by a rapid rise of the barometer and fall of temperature, and for several days the alternations of temperature were very large. On the night of the 15th, a S.W. to W. gale passed over Scotland, the weather at the time being very fine in London. Another gale blew from S.E. to N.E. in the Channel, on the night of the 24th, and from N.W. on the Cornish coast. Both gales were very destructive. This second gale in the south of Britain was co-incident with fine quiet weather in the north. The curve of the barometric diagrams for November is a remarkable one, the oscillations and variations being daily and excessive.

Barometer, highest, 30 45 inches on 1st and 17th; lowest, 28.67 on 11th; range, 1.78 inch.

Thermometer, highest in the shade, 60 deg. on 8th; lowest, 31 deg. on 4th, 17th, and 26th; severe ground frosts between 14th and 24th.

Rainfall, total fall in the month, 3.42 inches, distributed over twenty days, the greatest falls in one day being 0.52 on the 12th, and 0.53 on the 24th. November 1877 was therefore excessively wet and windy, often mild and without fogs.

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DECEMBER 31 Days

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● New Moon, 13th, 11.4 a.m. | ○ Full Moon, 28th, 4.16 p.m.

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4	Th	*St Barbara.* Sun sets, 3h. 51m.	9	15	27	3	2	338
5	F	Brooklyn theatre burned, 1876,	10	16	28	4	3	339
6	S	*St Nicholas* ....[300 killed	11	17	29	5	4	340
7	**S**	2 Sun. in Advent. *St Ambrose*	12	18	30	6	5	341
8	M	*Conception Blessed Virgin Mary*	13	19	May 1	7	6	342
9	Tu	Grouse Shooting ends	14	20	2	8	7	343
10	W	Capture of Plevna, 1877	15	21	3	9	8	344
11	Th	Length of day, 7h. 51m.	16	22	4	10	9	345
12	F	Saturn stationary. Cold period.	17	23	5	11	10	346
13	S	*St Lucy.* Lib. Min. France, 1877	18	24	6	12	11	347
14	**S**	3 Sun. in Advent. Uranus stat.	19	25	7	13	12	348
15	M	Visit of Queen to Lord Beacons-	20	26	8	14	13	349
16	Tu	Mars stationary ......[field, 1877	21	27	9	15	14	350
17	W	Mean temperature, 39° 4′	22	28	10	16	15	351
18	Th	Temperature of evapor., 38° 6′...	23	29	11	17	16	352
19	F	Twelve frosty nights in 1877 ...	24	30	12	18	17	353
20	S	Sun's altitude, 15°, rises 8h. 6m.	25	Oct. 1	13	19	18	354
21	**S**	4 Sun. in Advent. *St Thomas*	26	2	14	20	19	355
22	M	Great cold, 1877. [Shortest day	27	3	15	21	20	356
23	Tu	New Turk. constitu. form 1876	28	4	16	22	21	357
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27	S	*St John.* Comet appeared, 1823	2	8	20	26	25	361
28	**S**	1 Sun. aft. Xmas. Eclipse moon,	3	9	21	27	26	362
29	M	Gladstone b., 1809. | vis. Gr'nwich	4	10	22	28	27	363
30	Tu	Saturn sq. sun	5	11	23	29	28	364
31	W	*St Sylvester.* Sun nearest earth	6	12	24	30	Mar. 1	365

December.

1—Rotherham
1, 2—Warrington, cattle, horses
3—Spalding, store cattle
4—Nantwich, cattle
6—Cheltenham
6—Bodmin, cattle, sheep
6—Titchfield
6—Northwich, cattle, general
7—Leigh, cattle
8—Leicester, cattle, horses, sheep
8—Swindon, stock, pigs
8—Truro
9—Evesham
9—Newark
9—Reigate, cattle, pleasure
9, 11—Bradford, cattle, h., pl.
10—Melton-Mowbray, cattle
11—Abingdon
11—Boston
12—Chester, cattle, h., sh., pigs
12—Shewsbury
12—Thirsk
12—Trecastle
15—Oakham, cattle, h., sheep
15, 20—York, horses
16—Rugby
18—Arundel
18—Grantham
19—Bedford, cattle
20—Corween
22—Newport Pagnall
23—Swindon
26—Leek, cattle
26, 27—Sheffield, cattle, h., sheep
28—Bridgewater
30—Ulverstone, horses.

GARDEN KALENDAR FOR NOVEMBER.

Kitchen Garden.

The great business of the month is with the soil. As early as possible, every vacant space of ground should be trenched or dug up. The surface should be left as rough and lumpy as possible. Simply invert the earth, and by no means smash it with the spade after it is turned over. In summer digging, the usual practice is to bang, cut, or drive the upturned earth into fineness. All this must be carefully avoided now. Even the spadeful of earth must be turned gently, for fear of breaking it down in the process. There is a twofold reason for all this care—to expose as much surface to the air as possible, and prolong the season of roughness to the utmost limits. If soil be broken fine when inverted in winter, it soon consolidates into hardness. Snows and rains batter it down, and it might almost as well have been unturned. But left rough, every rain-drop pierces, every sunbeam warms, every fog and dew nourishes it; and it is gradually mellowed by natural forces into the finest tilth.

This is a good time to apply manures. If the manure cannot be got on before the rain has made the ground sticky, the wheeling must be deferred till the frost sets in.

It is likewise a good time for draining gardens. No garden should have stagnant water within 5 feet of the surface.

Sow early frame Peas and Mazagan Beans, for an early crop. Protect Endive, Celery, Artichoke, Seakale, with stable-litter or Ferns; mulch Asparagus with hotbed dung; take up Endive, late Cauliflower, early Broccoli, and Lettuces, and lay them in an open shed, or in old Cucumber and Melon pits, which will protect them from frost, and afford a supply during winter.

Fruit Garden.

Plant all sorts of fruit trees in fine weather, giving an abundant supply of water to settle the earth about the roots. Commence and carry on the various operations of pruning and nailing.

Forcing.

In hotbeds and pits keep up the requisite degree of heat by frequent additions to the linings. Cucumbers and Pines, on hotbeds, will require more than ordinary attention, to prevent them damping off from too much moisture. Where hot-water pipes are employed for heating, the necessary temperature and dryness are much more under the control of the gardener. Force Asparagus, Rhubarb, and Seakale in the Mushroom house or pits for a supply at Christmas. Attend to the forcing of Mushrooms. In the forcing houses, prune and train the trees; dig and dress the borders of those houses in which this operation has not already been done.

Greenhouse, &c.

All hardy greenhouse plants must now be properly protected, by being replaced in the greenhouse or in pits. Give abundance of air in fresh weather, only applying heat to keep out the frost during the night or to expel the damp, with the assistance of air through the day; remove all decayed or injured leaves, watering only such plants as require it. Commence the forcing of Rhododendrons, Kalmias, Roses Hyacinths, Tulips, in the stove or in pits.

Flower Garden, &c.

Plant dried tubers of border flowers, but the finer sorts had better be deferred till spring. Plant deciduous trees and shrubs as long as the weather continues favourable. Dig and dress flower borders and shrubberies.

THE WEATHER AND MARKETS.

The weather of November 1877 was very stormy, wet, and unsettled, temperature very high, with gales from the south and west. There was a remarkable absence of the usual November fogs. On the 10th, very severe southerly gales swept over the whole of the British Islands, and were accompanied by heavy rain. These gales were followed by a rapid rise of the barometer and fall of temperature, and for several days the alternations of temperature were very large. On the night of the 15th, a S.W. to W. gale passed over Scotland, the weather at the time being very fine in London. Another gale blew from S.E. to N.E. in the Channel, on the night of the 24th, and from N.W. on the Cornish coast. Both gales were very destructive. This second gale in the south of Britain was co-incident with fine quiet weather in the north. The curve of the barometric diagrams for November is a remarkable one, the oscillations and variations being daily and excessive.

Barometer, highest, 30 45 inches on 1st and 17th; lowest, 28.67 on 11th; range, 1.78 inch.

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GARDEN KALENDAR FOR DECEMBER.

Kitchen Garden.

There are little or no crops sown at this season. A first sowing of early Peas may be made, if not sown last month; or a second, if these have suffered by accidents from vermin. Mice and rats are often wonderfully destructive at this season. The fields are bare, and such ravenous visitors troop into our gardens, and make a clean sweep of such tender morsels as they can find. Black slugs are also very active under ground, and manage to destroy our crops at times in spite of all our precautions. A little earth should be drawn up to Peas and Beans in dry weather, to nourish, shelter, and strengthen the stems. Earth up Celery in dry weather, and protect from frost. Take up a week's supply at a time.

A few of the earliest varieties of Radishes may be sown at the foot of a south wall, or on a south sloping bank, to be sheltered with a thin layer of straw during severe weather. A pinch of Early Horn Carrot may be sown in similar places, and receive the same treatment. Endive may be taken up and placed in the cellar to preserve and blanch. Plant the roots in sand or earth, and keep the tops cool and dry, and in the dark.

Place a few roots of Rhubarb, Seakale, and Asparagus in warm places, to excite growth.

Hoe the ground among Onions, Spinach, and Cabbages. Remove all dying or dead leaves, and see that no frost-killed vegetables are allowed to pollute the air with their abominable odour. Nothing can be more offensive nor more unwholesome.

Fruit Garden.

Now the boughs are bare, all pruning ought to be pushed forward in suitable weather. It is not good practice to prune during severe frost. The wood is apt to split and rive if cut in a frozen condition. But at all other seasons, prune hardy fruit trees and bushes. Training is a cold business in December. Still, by picking mild days, or glimpses of sunshine, and by feeding the fire of enthusiasm within, it is astonishing how nimble and expert and warm the fingers become even in training trees on the bleak face of a bare wall.

The cleaning of trees should precede training, though we have placed it after it here. Trees ought to be unfastened from the wall and untied, to be thoroughly cleaned. The process of cleaning begins with the removal of all extraneous matter, such as dead leaves, rotten fruit, decaying bark, soot, dust, or other matters. These attract and conceal insect pests, and their removal is chiefly a precautionary or preventive measure. Then there are direct attacks upon scale, American blight, and larvæ of various kinds. All these must be washed, scrubbed, or scraped off, and bodily removed.

Forcing, &c.

Go on with the usual culture of those houses which have been commenced, or are now put into operation, attending to the necessary degrees of heat, &c.; the same attention to hotbeds and pits will be necessary as in the last month. Continue the forcing of Asparagus, Rhubarb, Seakale, and Mushrooms in pits, or in the Mushroom house.

Greenhouse, &c.

The directions for last month will be found equally applicable for this.

Flower Garden, &c.

The directions for last month will also be found applicable to this. Rake and sweep leaves from lawns and gravel walks, repairing the latter as occasion may require.

THE WEATHER AND MARKETS.

December, 1877, was a much quieter month than November. Northerly winds prevailed up to the 5th. On the 6th, a change took place, strong southerly and westerly winds setting in and blowing a gale in most parts of the country. The weather then became much finer over the southern counties, and cold nights were experienced almost continuously till the middle of the month. The 11th, however, was stormy, warm, and damp. On the 17th and 18th, the wind was more northerly, and temperature fell rapidly. On the 20th, the barometer reached the high reading of 30.69 inches, its culminating point for the month. From the 22d, S.W. and N.W. winds prevailed, showery periods alternating with spells of bright, clear weather until the 28th. Christmas Day was fine, with a little rain, just enough to be registered. After 28th, the temperature rose rapidly, attended by very warm and wet days, 29th and 30th, succeeded by colder and drier weather.

Barometer, highest, 30.69 inches, on 20th; lowest, 29.15 inches, on 1st; range, 1.54 inch.

Thermometer in shade, highest, 54 deg., on 29th; lowest, 27 deg., on 28th. Frost on grass, fifteen days; in air, nine times; lowest on grass, 18 deg., on 15th.

Rainfall, 1.52 inch, rather more than half the average, falling on nineteen days, the greatest fall, 0.32 inch in one day, being on 29th.

Farm work was often carried on favourably.

The markets of December were free alike from excitement and depression. The average value of Wheat for the month was 51/6; the averages of five weeks were—51/7, 51/4, 51/7, 51/4, and 51/9, a remarkable even range. The fluctuations of the year were as follows:—January, 51/8; February, 51/6; March, 51/2; April, 53/4; May, 66/1; June, 64/6; July, 62/9; August, 64/11; September, 59/1; October, 53/7; November, 52/2; December, 51/6. The great change upwards in price in April and May arose from the Russian and Turkish War. The immense shipments from Atlantic ports made the year 1877 unparalleled. The excitement of the war carried value higher by about 10/ than events justified; when the 10/ reduction was allowed, prices were fairly well maintained.

Throughout December, 1877, the market demand was healthy and regular, and the price of red American Wheat improved through a comparative decrease of shipments. Stocks were reduced to an ordinary quantity. The expectation of peace was very general through Christmas-tide. The stocks in the principal ports at the end of the year were reckoned about 1,500,000 qr. of Wheat. The supplies of the five weeks which happened to be made up in December, 1877, were—home, 852,600 qr.; foreign Wheat and Flour, 1,566,000 qr. Altogether, the grain trade at the end of December was firmer and better for sellers than at the commencement of the month.

The Court and Cabinet.

THE ROYAL FAMILY.

THE QUEEN.—**Victoria**, born May 24, 1819; succeeded to the throne June 20, 1837; crowned June 28, 1838; and married Feb. 10, 1840, to Prince **Albert** (born Aug. 26, 1819, and died Dec. 14, 1861). Her Majesty is the only child of the late Edward, Duke of Kent, son of King George III. The Children of Her Majesty are:—

1. **Victoria**, Princess Royal, born Nov. 21, 1840, married to Prince Frederick-William of Prussia, Jan. 25, 1858, and has issue four sons and four daughters.
2. **Albert-Edward**, Prince of Wales, born Nov. 9, 1841; married, March 10, 1863, to Princess **Alexandra** of Denmark, born Dec. 1, 1844, and has issue two sons and three daughters—Albert, born Jan. 8, 1864; George, born June 3, 1865; Louisa, born February 20, 1867; Victoria, born July 6, 1868; Maud, born Nov. 26, 1869; and Alexander, born April 6, 1871, died April 7, 1871.
3. **Alice**, born April 25, 1843; married to Prince Frederick Louis of Hesse, July 1, 1862, and has issue five daughters and one son.
4. **Alfred**, Duke of Edinburgh, born Aug. 6, 1844; married Jan. 23, 1874, to Marie-Alexandrovna, only daughter of the Emperor of Russia, and has issue one son, and three daughters.
5. **Helena**, born May 25, 1846; married July 5, 1866, Prince Frederick Christian of Schleswig-Holstein, and has issue two sons and two daughters.
6. **Louise**, born March 18, 1848; married March 21, 1871, to John Douglas, Marquis of Lorne, eldest son of the Duke of Argyll.
7. **Arthur**, Duke of Connaught, born May 1, 1850.
8. **Leopold** born April 7, 1853.
9. **Beatrice**, born April 14, 1857.

George, Duke of Cambridge, K.G., cousin to Her Majesty, born March 26, 1819.

Augusta, Duchess of Cambridge, aunt to Her Majesty, born July 25, 1795; married, May 17, 1818, to the late Duke of Cambridge.

George, ex-King of Hanover and Duke of Cumberland, cousin to Her Majesty, born May 27, 1819, married Princess Frederica of Mecklenburg-Strelitz, and has issue a son and two daughters.

Augusta, daughter of the late Duke of Cambridge, and cousin to Her Majesty, born July 19, 1822, married, June 28, 1843, to Frederick, Grand Duke of Mecklenburg-Strelitz, and has issue a son.

Mary, Princess Teck, daughter of the late Duke of Cambridge, and cousin to Her Majesty, born Nov. 27, 1833; married June 7, 1866, Prince Teck, and has issue two sons and one daughter.

HER MAJESTY'S MINISTERS.

First Lord of the Treasury.—Earl Beaconsfield.
Lord High Chancellor.—Lord Cairns.
Lord President of the Council.—Duke of Richmond.
Lord Privy Seal.—Duke of Northumberland.
Chancellor of the Exchequer.—Sir S. H. Northcote, Bt.
Secretary for Home Department.—R. A. Cross.
Secretary for Foreign Affairs.—Marquis of Salisbury.
Secretary for Colonies.—Sir M. H. Beach.
Secretary for War.—F. A. Stanley.
Secretary for India.—Viscount Cranbrook.
First Lord of the Admiralty.—W. H. Smith.
Post-Master General.—Lord J. J. R. Manners.
President of the Board of Trade.—Viscount Sandon.

The above form the Cabinet.

First Commissioner of Works.—G. J. Noel.
President of the Local Government Board.—G. S. Booth.
President Council of Education.—Duke of Richmond.
Chancellor of the Duchy of Lancaster—Col. T. Taylor.
Judge Advocate General—G. A. C. Bentinck
Lord Great Chamberlain.—Lord Aveland.
Chairman of Inland Revenue.—C. J. Harries.
Registrar-General.—George Graham.

SCOTLAND.

Lord High Constable.—Earl of Erroll.
Keeper of the Great Seal.—Earl of Selkirk.
Master of the Household.—Duke of Argyll.
Lord High Commissioner.—Earl of Rosslyn.
Lord Justice General.—John Inglis.
Lord Justice-Clerk.—Lord Moncreiff.
Lord-Advocate.—W. Watson.
Solicitor-General.—J. H. A. Macdonald.
Lord Clerk Register.—
Commander of the Forces.—Lieut.-Gen. J. R. Stuart.

IRELAND.

Lord-Lieutenant.—Duke of Marlborough.
Chief-Secretary.—J. Lowther.
Private Secretaries.—P. B. Bernard, C. Beresford.
Lord Chancellor.—Dr Ball.
Lord-Justice of Appeal.—
Master of the Rolls.—
Attorney-General.—E. Gibson.
Solicitor-General.—G. Fitzgibbon.
Commander of the Forces.—General Sir J. Michel.

THE ROYAL HOUSEHOLD.

LORD STEWARD'S DEPARTMENT.

Lord Steward.—Earl Beauchamp.
Treasurer.—Lord Henry Thynne.
Comptroller.—Lord Henry Somerset.
Master of the Household.—Sir J. C. Cowell.
Secretary of Board of Green Cloth.—E. M. Browell.
Paymaster of the Household.—T. C. March.

LORD CHAMBERLAIN'S DEPARTMENT.

Lord Chamberlain.—Marquis of Hertford.
Vice-Chamberlain.—Viscount Barrington.
Comptroller.—S. C. B. Ponsonby Fane.
Chief-Clerk.—G. T. Hertslet.
Keeper of Privy Purse.—Lt.-Gen. Sir T. M. Biddulph.
Private Sec. to Her Majesty.—Lt.-Gen. H. Ponsonby.
Secretary.—D. C. Bell.
Captain, Yeomen of Guard.—Lord Skelmersdale.
Captain of Gentlemen-at-Arms—Earl of Coventry.
Master of Ceremonies.—Gen. Sir F. Seymour, Bt.
Lord High Almoner.—Dean of Windsor.
Dean of Chapel Royal.—Bishop of London.
Mistress of the Robes.—Duchess of Wellington.
Groom of the Stole.—H. D. Erskine.

MASTER OF THE HORSE'S DEPARTMENT.

Master of the Horse.—Earl of Bradford.
Clerk-Marshal.—Lord Alfred Paget.
Crown Equerry and Secretary. —Col. G. A. Maude.
Master of the Buckhounds.—Earl of Hardwicke.

Imperial Parliament.

ALPHABETICAL LIST OF THE HOUSE OF PEERS.

Speaker—LORD CAIRNS, Lord Chancellor.

The Names of Roman Catholic Peers are printed in *Italics*.

Abercorn, D
Abercromby, L
Aberdare, L
Aberdeen, E
Abergavenny, M
Abingdon, E
Abinger, L
Acton, L
Ailesbury, M
Ailsa, M
Airey, L
Airlie, E
Albemarle, E
Alington, L
Amherst, E
Anglesey, M
Annaly, L
Annesley, E
Argyll, D
Arundell, L
Ashburnham, E
Ashburton, L
Athlumney, L
Athole, D
Auckland, L
Aveland, L
Aylesford, E
Bagot, L
Balfour of Bur, L
Bangor, Bp
Bangor, V
Bantry, E
Bateman, L
Bath, M
Bath & Wells, Bp
Bathurst, E
Beaconsfield, E
Beauchamp, E
Beaufort, D
Beaumont, L
Bedford D
Belmore, E
Belper, L
Berkeley, E
Berwick, L
Bessborough, E
Blachford, L
Blackburn, L
Blantyre, L
Bloomfield, L
Bolingbroke, V
Bolton, L
Boston, L
Boyne, V
Bradford, E
Braybrooke, L
Breadalbane, E
Bridport, V
Bristol, M
Brougham, L
Brownlow, E
Buccleuch, D
Buckingham, D
Buckinghamsh, E
Bury, V
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Cadogan, E
Cairns, L
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Camden, M
Camoys, L
Camperdown, E
Canterbury, Abp
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Cardwell, V
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Carnarvon, E
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Carysfort, E
Castlemaine, L
Castletown, L
Cathcart, E
Cawdor, E
Charlemont, E
Chelmsford, L
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Churchill, L
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Cleveland, D
Clifden, V
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Clinton, L
Clonbrock, L
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Coleridge, L
Colville of Culrs, L
Combermere, V
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Cork & Orrery, E
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Cottesloe, L
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Cowley, E
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Cranbrook, V
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Crofton, L
CUMBERLAND, D
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Darnley, E
Dartmouth, E
Dartrey, E
De Clifford, L
De Freyne, L
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De La Warr, E
De L'Isle & Dud, L
De Mauley, L
Denbigh, E
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Derby, E
De Ros, L
De Saumarez, L
De Tabley, L
Devon, E
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Dynevor, L
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Doneraile, V
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Dorchester, L
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Ducie, E
Dudley, E
Dufferin, E
Dunboyne, L
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Dunraven, E
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EDINBURGH, D
Effingham, E
Egerton, L
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Ellesmere, E
Elphinstone, L
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Enfield, V
Enniskillen, E
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Erskine, L
Essex, E
Eversley, V
Exeter, Bp
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Gardner, L
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Guilford, E
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Hanmer, L
Hardinge, V
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Harrowby, E
Hastings, L
Hatherley, L
Hatherton, L
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Hereford, V
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Heytesbury, L
Hill, V
Home, E.
Hood, V
Hopetoun, E
Houghton, L
Howard de Wal, L
Howard of Glos, L
Howe, E
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Huntly, M
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Ilchester, E
Inchiquin, L
Jersey, E
Keane, L
Kenmare, E
Kenyon, L
Kesteven, L
Kimberley, E
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Lanesborough, E
Lansdowne, M
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Leconfield, L
Leeds, D
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Lifford, V
Lilford, L
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Londesborough, L
London, Bp
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Lonsdale, E
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Lucan, E
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Lyons, L
Lyttleton, L
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Lyveden, L
Macclesfield, E
Malmesbury, E
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Massereene, V
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Methuen, L
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Morley, E
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Mount Cashell, E
M'nt-Edgcumbe, E
Mowbray, L
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Nelson, E
Newcastle, D
Norfolk, D
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Normanton, E
Northampton, M
Northbrook, E
N'rthumberl'nd, D
Northwick, L
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Norwich, Bp
O'Hagan, L
O'Neill, L
Onslow, E
Oranmore, L
Orford, E
Ormathwaite, L
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Penzance, L
Peterborough, Bp
Petre, L
Plunket, L
Poltimore, L
Portarlington, E
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Portman, V
Portsmouth, E
Poulett, E
Powerscourt, V
Powis, E
Queensberry, M
Radnor, E
Raglan, L
Ranfurly, E
Ravensworth, E
Rayleigh, L
Redesdale, E
Ribblesdale, L
Richmond, D
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Rivers, L
Robartes, L
Roden, E
Rodney, L
Rollo, L
Romilly, L
Romney, E
Rosebery, E
Rosse, E
Rosslyn, E
Rossmore, L
Roxburghe, D
Russell, E
Rutland, D
Sackville, L
St Albans, Bp
St Albans, D
St Asaph, Bp
St Davids, Bp
St Germans, E
St John, L
St Leonards, L
St Vincent, V
Salisbury, Bp
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Saltoun, L
Sandhurst, L
Sandwich, E
Sandys, L
Saye and Sele, L
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Seafield, E
Seaton, L
Sefton, E
Selborne, L
Selkirk, E
Shaftesbury E
Shannon, E
Sheffield, E
Sherborne, L
Shrewsbury, E
Sidmouth, V
Sinclair, L
Skelmersdale, L
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Sondes, L
Southampton, L
Southesk, E
Spencer, E
Stafford, L
Stair, E
Stamford, E
Stanhope, E
Stanley of Alder, L
Stradbroke, E

Strafford, E
Stratford de Red, V
Strathallan, V
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Strathmore, E
Strathnairn, L
Sudeley, L
Suffield, L
Suffolk, E
Sutherland, D
Sydney, E
Talbot de Mal, L
Tankerville, E
Templemore, L
Templetown, V
Tenterden, L
Teynham, L
Thurlow, L
Tollemache, L
Torrington, V
Townshend, M
Tredegar, L
Truro, L
Vaux, L
Ventry, L
Vernon, L
Verulam, E
Vivian, L
Waldegrave, E
WALES, Prince of
Walsingham, L
Warwick, E
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Waveney, L
Wellington, D
Wemyss, E
Wenlock, L
Wentworth, L
Westbury, L
Westminster, D
Westmorland, E
Wharncliffe, E
Wicklow, E
WilloughbydeB, L
Wilton, E
Winchester, Bp
Winchester, M
Winchilsea, E
Windsor, L
Winmarleigh, L
Wolverton, L
Worcester, Bp
Wrottesley, L
Wynford, L
Yarborough, E
York, Abp
Zetland, E
Zouche, L

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Banbury	B. Samuelson
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	John Bright
	Joseph Chamberlain
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	J. K. Cross
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Bridport	P. Ralli
Brighton	J. L. Ashbury
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	S. Morley
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	T. F. Fremantle
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Burnley	P. Rylands
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Bury St Edmund's	E. Greene Lord F. Hervey
Calne	Lord Fitzmaurice
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	B. B. H. Rodwell
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	P. B. Smollett
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Cardigan, &c.	David Davies
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Carnarvon, &c.	W. B. Hughes
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	J. G. Dodson
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Chippenham	G. Goldney
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	Lt.-Col. E. H. Digby
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	Sir G. Elliot, Bart.
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	Lt.-Col. F. Beaumont
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	Sir A. E Middleton
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	Lt-Col S. B. R. Brise
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	Lord E. H. B. G. Cecil
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Finsbury	W. T. M'C. Torrens
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	C. R. M. Talbot
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West	R. R. E. Plunket
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Gloucester	W. K. Wait
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Greenwich	T. W. Boord
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Hertford	A. J. Balfour

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Hereford	G. Clive
	Lt-Col. G. Arbuthnot
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	A. Smith
	H. F. Cowper
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Huddersfield	E. A. Leatham
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	Viscount Mandeville
Huntingdon	Visc. Hinchingbrook
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Ipswich	J. R. Bulwer
	T. C. Cobbold
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	W. Deedes
Mid	Sir W. H. Dyke, Bt.
	Viscount Holmesdale
West	Sir C. H. Mills, Bt.
	Viscount Lewisham
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	C. M. Norwood
Knaresborough	B. T. Woodd
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	Ald. W. M'Arthur
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South-Wst.	R. A. Cross
	Col. Blackburne
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	J. Barran
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South	A. Pell
	W. U. Heygate
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Mid	H. Chaplin
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	J. Torr
	W. Rathbone
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	G. J. Goschen
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	E. Ridley
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	Sir J. Holker
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	G. Palmer
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Rochester	A. J. Otway
	P. W. Martin
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	G. H. Finch
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	Sir P. J. W. Miles, Bt
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Truro	Col Sir F. M. Williams
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Wareham	J. S. W. S. E. Drax
Warrington	Sir G. Greenall, Bt.
WARWICK, N.	C. N. Newdegate
	W. B. Davenport
South	Earl of Yarmouth
	Sir J. E. Wilmot, Bt.
Warwick	G. W. J. Repton
	A. W. Peel
Wednesbury	A. Brogden
Wenlock	A. H. Brown
	C. T. W. Forester
Westbury	A. Laverton
Westminster	W. H. Smith
	Sir C. Russell, Bt.
WESTMORLAND	Earl of Bective
	W. Lowther
Weymouth & Melc. Regis	H. Edwards
	Sir F. Johnstone, Bt.
Whitby	W. H. Gladstone
Whitehaven	G. A. C. Bentinck
Wigan	Lord Lindsay
	T. Knowles
Wight, Isle of	A. Baillie Cochrane
Wilton	S. Herbert
WILTS, North	G. S. Estcourt
	Sir G. S. Jenkinson
South	Lord H. F. Thynne
	Viscount Folkestone
Winchester	W. B. Simonds
	A. R. Naghten
Windsor	R. R. Gardner
Wolverhampton	C. P. Villiers
	T. M. Weguelin
Woodstock	Lord R. Churchill
WORCESTER East	H. Allsopp
	T. E. Walker
West	F. W. Knight
	Sir E. H. Lechmere
Worcester	T. R. Hill
	J. D. Allcroft
Wycombe	Lt.-Col. Carington
YORK, North Riding	F. A. Milbank
	Viscount Helmsley
East Rid.	C. Sykes
	W. H. H. Broadley
WestRid. North	Lord F. C. Cavendish
	Sir M. Wilson, Bt.
WestRid. South	W. T. W. S. Stanhope
	L. R. Starkey
WestRid. East	C. B. Denison
	J. Fielden
York	G. Leeman
	J. Lowther

IRELAND—103 *Members.*

ANTRIM	J. Chaine
	E. O'Neill
ARMAGH	E. W. Verner
	M. C. Close
Armagh	Capt. G. Beresford
Athlone	E. Shiel
Bandon	A. Swanston
Belfast	J. P. Corry
	W. Ewart
CARLOW	H. Bruen
	A. Kavanagh
Carlow	H. O. Lewis
Carrickfergus	M. R. Dalway
CAVAN	C. J. Fay
	J. G. Biggar
CLARE	Lord F. Conyngham
	Sir B. Loghlen, Bart.
Clonmel	A. J. Moore
Coleraine	D. Taylor
CORK	M'Carthy Downing
	W. Shaw
Cork	N. D. Murphy
	W. Goulding
DONEGAL	Marquis of Hamilton
	W. Wilson
DOWN	Lord A. E. H. Trevor
	Viscount Castlereagh
Downpatrick	J. Mulholland
Drogheda	Dr W. H. O'Leary
DUBLIN	I. T. Hamilton
	Lieut.-Col. Taylor
Dublin	Sir A. Guinness, Bt.
	M. Brooks
Dublin Univer.	D. R. Plunket
	E. Gibson
Dundalk	P. Callan
Dungannon	T. A. Dickson
Dungarvan	F. H. O'Donnell
Ennis	Capt. W. Stacpoole
Enniskillen	Viscount Crichton
FERMANAGH	W. H. Archdale
	Lieut-Col H. A. Cole
GALWAY	Major J. P. Nolan
	M. Henry
Galway	G. Morris
	Dr M. F. Ward
KERRY	H. A. Herbert
	R. P. Blennerhasset
KILDARE	C. H. Meldon
	W. H. F. Cogan
KILKENNY	G. L. Bryan
	P. Martin
Kilkenny	B. Whitworth
KING'S Co.	Sir P. O'Brien, Bart.
	Sergeant D. Sherlock
Kinsale	E. Collins
LEITRIM	Dr J. Brady
	Major F. O'Beirne
LIMERICK	W. H. O'Sullivan
	E. J. Synan
Limerick	I. Butt
	R. O'Shaughnessy
Lisburn	Sir R. Wallace, Bart
LONDONDERRY	Dr R. Smyth
	H. Law
Londonderry	C. E. Lewis
LONGFORD	Major M. W. O'Reilly
	G. Errington
LOUTH	A. M. Sullivan
	G. H. Kirk
Mallow	J. G. MacCarthy
MAYO	G. E. Browne
	J. O'Conner Power
MEATH	N. Ennis
	C. S. Parnell
MONAGHAN	Sir J. Leslie, Bart
	S. E. Shirley
NEW ROSS	J. Dunbar
Newry	W. Whitworth
Portarlington	Capt. L. D. Damer
QUEEN'S Co.	K. T. Digby
	E. Dease
ROSCOMMON	C. O. O'Conor
	C. French
SLIGO	D. M. O'Conor
	E. R. K. Harman
TIPPERARY	S. Moore
	E. D. Gray
Tralee	D. O'Donoghue
TYRONE	J. W. E. Macartney
	H. W. L. Corry
WATERFORD	Lord C. Beresford
	J. Delahunty
Waterford	R. Power
	Major P. O'Gorman
WESTMEATH	P. G. Smyth
	Lord R. Montagu
WEXFORD	Sir G. Bowyer, Bart
	Chevalier K. O'Clery
Wexford	W. A. Redmond
WICKLOW	W. R. O'Byrne
	W. W. F. Dick
Youghal	Sir J. N. McKenna

SCOTLAND—60 *Members.*

ABERDEEN, E.	Lt-Gn. Sir A. Gordon
West	Lord D. Gordon
Aberdeen	J. F. Leith
ARGYLL	Lord C. Campbell
AYR, North	R. Montgomerie
South	Col. C. Alexander
Ayr, Irvine, &c.	Sir W. J. Cunningham
BANFF	R. W. Duff
BERWICK	R. B. Hamilton
BUTE	C. Dalrymple
CAITHNESS	Sir J. G. T. Sinclair, Bt
CLACKMANNAN & KINROSS	W. P. Adam
DUMBARTON	A. O. Ewing
DUMFRIES	Capt. J. H. Johnstone
Dumfries, &c.	E. Noel
Dundee	J. Yeaman
	E. Jenkins
EDINBURGH	Earl of Dalkeith
Edinburgh	D. M'Laren
	J. Cowan
Edin & St Andr's Universities	Dr Lyon Playfair
ELGIN & NAIRN	Viscount Macduff
Elgin, Banff, &c.	M. E. Grant Duff
Falkirk, &c.	J. Ramsey
FIFE	Sir R. Anstruther, Bt
FORFAR	J. W. Barclay
Glasgow	Dr C. Cameron
	G. Anderson
	A. Whitelaw
Glasgw & Aberdn Universities	W. Watson
Greenock	J. Stewart
HADDINGTON	Lord Elcho
Haddington, &c.	Lord W. M. Hay
Hawick, &c.	G. O. Trevelyan
INVERNESS	D. Cameron
Inverness, &c.	C. F. Mackintosh
Kilmarnock, &c.	J. F. Harrison
KINCARDINE	Gen. Sir G. Balfour
Kirkcaldy, &c.	Sir G. Campbell
KIRKCUDBRIT.	J. Maitland
LANARK, N.	Sir T. Colebrooke, Bt
South	Sir W. Anstruther, Bt
Leith, &c.	A. Grant
LINLITHGOW	P. M'Lagan
Montrose, &c.	W. E. Baxter
ORKNY & SHET	S. Laing
Paisley	W. Holms
PEEBLES	Sir G. Montgomery
PERTH	Lt.-Col. D. Moray
Perth	C. S. Parker
RENFREW	Col. W. Mure
ROSS & CROMRTY	A. Matheson
ROXBURGH	Sir G. H. Douglas, Bt
St Andrews, &c.	E. Ellice
STIRLING	Sir W Edmonstone, Bt
Stirling, &c.	H. C. Bannerman
SUTHERLAND	Marquis of Stafford
Wick, &c.	J. Pender
WIGTON	R. V. Agnew
Wigton, &c.	M. J. Stewart

OFFICERS OF THE HOUSES OF PARLIAMENT.

HOUSE OF PEERS.

Clerk of Parliament.—Sir William Rose.
Clerk-Assistant.—Ralph Disraeli.
Counsel to Chairman of Committee.—J. H. Warner.
Chief Clerk.—E. M. Parratt.
Index Clerk.—P. Birch.
Principal Clerk, Private Committees.—W. H. Haines.
Principal Private Bill Clerk.—B. S. R. Adam.
Clerk of Printed Paper Office.—O. E. Grant.
Principal Judicial Clerk.—A. W. Dubourg.
Clerk of the Journals.—L. Birch.
Clerk attending the Table.—A. Harrison.
Clerk of Public Bills.—H. C. Malkin.
Receiver of Fees and Accountant.—W. A. Malony.
Librarian.—J. H. Pulman.
Examiners for Stand. Od.—C. Frere, J. H. Robinson.
Gentleman Usher of Black Rod.—Gen. Sir W. Knollys.
Yeoman-Usher.—Colonel R. C. Spencer Clifford.
Sergeant-at-Arms.—Lieut.-Col. Talbot.
Resident Superintendent.—Mr Scott.
Short-hand Writer.—W. H. Gurney Salter
Doorkeepers.—Brophey, Holloway, and Goddard.
Superintendent of Refreshment Rooms.—Mr Aggas.
Housekeeper.—Mrs Lovegrove.
Police Inspector.—Mr Butler.

HOUSE OF COMMONS.

Clerk of the House.—Sir T. Erskine May.
,, *Assistant.*—R. Palgrave.
,, *of Public Bills.*—W. Rose.
,, *of Committees.*—C. Eales.
,, *of Journals.*—J. B. Bull.
,, *of Private Bills.*—H. B. Mayne.
Accountant.—W. O. Mayne.
Short-hand Writer.—W. H. Gurney Salter.
Deliverer of Votes.—R. M. Bailey.
Sergeant-at-Arms.—R. A. Gossett.
Deputy Sergeant.—H. D. Erskine.
Assistant-Sergeant.—Colonel Forester.
Doorkeepers.—G. Hartley and J. Jarratt.
Postmaster.—E. W. Pike.
Superintendent of Members' Waiting Room.—H. Cove.
Superintendent of Refreshment Rooms.—Mr Nicholes.
Chaplain to the House.—Rev. F. Byng, M.A.
Secretary to the Speaker.—C. W. Campion.
Counsel to the Speaker.—G. K. Rickards.
Examiners of Private Bills.—C. Frere, J. Robinson.
Taxing Master.—C. Frere.
Librarian.—G. Howard.
Trainbearer to the Speaker.—G. Brown.
Police Inspector.—Mr Denning.

SUMMARY OF THE HOUSES OF PARLIAMENT.

HOUSE OF PEERS.

Peers of the Blood Royal	5
Archbishops	2
Dukes	21
Marquises	19
Earls	114
Viscounts	25
Bishops	24
Barons	249
Scotch Representative Peers	16
Irish Representative Peers	28
Total	503

HOUSE OF COMMONS.

ENGLAND—40 Counties	172	Members	459
,, 184 Cities, Boroughs, &c.	282	,,	
,, 3 Universities	5	,,	
WALES — 12 Counties	15	,,	30
,, 14 Districts of Boroughs	15	,,	
SCOTLAND—33 Counties	32	,,	60
,, 22 Cities, Burghs, &c.	26	,,	
,, 4 Universities	2	,,	
IRELAND — 32 Counties	64	,,	103
,, 31 Cities and Boroughs	37	,,	
,, 1 University	2	,,	
		Total	652

Stamps and Taxes.

STAMP DUTIES.

AFFIDAVITS or **Statutory Declarations** before a magistrate under 5 to 6 Wm. IV. cap. 62	0	2	6
APPRENTICESHIP INDENTURES			
When no premium is paid	0	2	6
In any other case, for every £5 of premium paid	0	5	0
ARTICLES of CLERKSHIP			
To an attorney or solicitor in England or Wales	80	0	0
To an attorney of the County Palatine of Lancaster, writer to the signet, or solicitor in Scotland	60	0	0

APPRAISEMENT or valuation of any property, or of any interest therein, or of the annual value thereof, or of any dilapidations, or of any repairs wanted, or of the materials and labour used or to be used in any building, or of any artificers' work whatsoever :—

Not exceeding £5				£0	0	3
Exceeding £5 and not exceeding £10				0	0	6
,,	10	,,	20	0	1	0
,,	20	,,	30	0	1	6
,,	30	,,	40	0	2	0
,,	40	,,	50	0	2	6
,,	50	,,	100	0	5	0
,,	100	,,	200	0	10	0
,,	200	,,	500	0	15	0
,,	500			1	0	0

Exemptions.—Appraisement or valuation made for, and for the information of, one party only, and not being in any manner obligatory as between parties either by agreement or operation of law. Appraisement or valuation made in pursuance of the order of any Court of Admiralty or for the purpose of ascertaining the legacy or succession duty.

AWARD in England or Ireland, and **Award** or **Decreet Arbitral** in Scotland. Where the amount or value of the matter in dispute—

Not exceeding £5				£0	0	3
Exceeding £5 and not exceeding £10				0	0	6
,,	10	,,	20	0	1	0
,,	20	,,	30	0	1	6
,,	30	,,	40	0	2	0
,,	40	,,	50	0	2	6
,,	50	,,	100	0	5	0
,,	100	,,	200	0	10	0
,,	200	,,	500	0	15	0
,,	500	,,	750	1	5	0
,,	1000	,,		1	15	0

MORTGAGE, **Bond**, **Debenture**, **Covenant**, **Warrant of Attorney** to confess and enter up judgment, and **Foreign Security** of any kind, being the only, or principal, or primary security for the payment or repayment of money—

Not exceeding £25				£0	0	8
Exceeding £25 and not exceeding £50				0	1	3
,,	50	,,	100	0	2	7
,,	100	,,	150	0	3	9
,,	150	,,	200	0	5	0
,,	200	,,	250	0	6	3
,,	250	,,	300	0	7	6
For every £100, or fractional part of each £100, exceeding £300				0	2	6

BILL OF LADING of any goods, merchandise, or effects to be exported or carried coastwise	£0	0	6
BOND, or **Instrument** to secure any sum of money, not secured by a duly stamped instrument, for every £5	0	2	6
Bond of any kind not specifically charged with duty, and when the amount does not exceed £300, the same *ad valorem* duty as a Bond for a limited amount.			
In any other case	0	10	0
CONVEYANCE, or **TRANSFER**, whether on sale or otherwise—			
Of any stock in the Bank of England, not exceeding £25	0	9	0
Exceeding £25	0	12	0
Of any stock in the East India Company	1	10	0
Of any debenture stock or funded debt of any company or corporation. For every £100, and also for any fractional part of £100, of the nominal amount transferred	0	2	6
On sale of any property (except such stock or debenture stock or funded debt as aforesaid) :—			

Not exceeding £5				0	0	6
Exceeding £5 and not exceeding £10				0	1	0
,,	10	,,	15	0	1	6
,,	15	,,	20	0	2	0
,,	20	,,	25	0	2	6
,,	25	,,	50	0	5	0
,,	50	,,	75	0	7	6
,,	75	,,	100	0	10	0
,,	100	,,	125	0	12	6
,,	125	,,	150	0	15	0
,,	150	,,	175	0	17	6
,,	175	,,	200	1	0	0
For every £50, and any fractional part of £50 of such amount or value				0	5	0

POWER of ATTORNEY for sole purpose of voting by proxy	0	0	1
By any petty officer, seaman, or marine, or soldier serving, of any such person for receiving prize money or wages	0	1	0
For the receipt of the dividends or interests of any stock—			
Where made for the receipt of one payment only	0	1	0
In any other case	0	5	0
For the receipt of any sum of money, or any bill of exchange or promissory note for any sum of money, not exceeding £20, or any periodical payments not exceeding the annual sum of £10 (not being hereinbefore charged)	0	5	0
For the sale, transfer, or acceptance of any of the Government or Parliamentary stocks or funds :—			
Where the value of such stocks or funds does not exceed £20	0	5	0
In any other case	0	10	0
Of any kind not herinbefore described	0	10	0

Exemptions.—Letters or power of attorney for the receipt of dividends of any definite and certain share of the Government or Parliamentary stocks or funds producing a yearly dividend of less than £3.

LEASE—For any definite term less than a year:—

	£	s.	d.
Of any dwelling-house or tenement, at a rent not exceeding £10 per annum	£0	0	1
Of any furnished dwelling-house or apartments, where the rent for such term exceeds £25	0	2	6

Of any lands, tenements, or heritable subjects, except or otherwise than as aforesaid, the same duty as a lease for a year at the rent reserved for the definite term.

For any other term :

Where the yearly rent or otherwise is at a rate:—	Not exc. 35 years		Ex. 35 years but not 100.			Exceeding 100 years.		
	s.	d.	£	s.	d.	£	s.	d.
Not exc. £5 per annum	0	6	0	3	0	0	6	0
Ex. £5 and not ex. £10...	1	0	0	6	0	0	12	0
,, 10 ,, 15...	1	6	0	9	0	0	18	0
,, 15 ,, 20...	2	0	0	12	0	1	4	0
,, 20 ,, 25...	2	6	0	15	0	1	10	0
,, 25 ,, 50...	5	0	1	10	0	3	0	0
,, 50 ,, 75...	7	6	2	5	0	4	10	0
,, 75 ,, 100...	10	0	3	0	0	6	0	0
For every full sum of £50 and also for any fractional part of £50 thereof	5	0	1	10	0	3	0	0

	£	s.	d.
Of any other kind whatsoever not hereinbefore described	0	10	0

Note.—The 1d. duty upon small and short lettings may be denoted by an adhesive stamp.

MISCELLANEOUS—

	£	s.	d.
Grant of arms, or armorial ensigns only, under the sign manual, or by any of the kings-of-arms of England, Scotland, or Ireland	10	0	0
Grant or license, under the sign manual, to take and use a surname and arms, or a surname only. In compliance with the injunction of any will or settlement	50	0	0
Upon any voluntary application ...	10	0	0
Contract note for the purchase of any stock or marketable security	£0	0	1
Letters of allotment of any company or proposed company, or letter of renunciation	0	0	1
Scrip certificate, or other document ...	0	0	1
Certificate of the registration of a design	5	0	0
Agreement or memorandum made without any clause of registration, whether the same be only evidence of contract, and not otherwise charged with duty...	0	0	6
Agreement or contract made or entered into under the Highway Acts ...	0	0	6
Copy or extract (certified) from any register of births, baptisms, marriages, deaths, or burials	0	0	1

BILLS OF EXCHANGE.

Bill of Exchange, Draft and Promissory Note of any kind, payable on demand or at any other time, for any sum of money :—

	£	s.	d.
Not exceeding £5	£0	0	1
Exceeding £5 and not exceeding £10 ...	0	0	2
,, 10 ,, 25 ...	0	0	3
,, 25 ,, 50 ...	0	0	6
,, 50 ,, 75 ...	0	0	9
,, 75 ,, 100 ...	0	1	0
,, 100 ,, 200 ...	0	2	0

For every additional £100, or fractional part of £100 over the first £100, an additional duty of 1s.

RECEIPTS.

For £2 and upwards ... ... One Penny.

N.B.—Persons receiving the money are to pay the duty.

Receipts may be stamped within fourteen days of date, on payment of £5, or within one month on payment of £10 penalty; after that time they cannot be stamped.

	£
Penalty for giving a receipt without a stamp	£10
Penalty for not effectually cancelling or obliterating adhesive stamps when used ...	10
Penalty for frauds in the use of adhesive stamps	20

ASSESSED TAXES.

ARMORIAL BEARINGS.

	£	s.	d.
If such armorial bearings are painted on any carriage	£2	2	0
If not so painted, but shall be otherwise worn or used	1	1	0

Note.—Armorial bearings means any arms, crest, or ensign worn or used.

INCOME TAX.

From April 1878 to April 1879, all incomes of £150 per annum, and not exceeding £400, are taxed at the rate of 5d. in the pound, after allowing a deduction of £120 on incomes of less than £400:—for example, a man earning £150 will be rated only at £30. Incomes of £400 and upwards are rated at 5d. in the pound without any deduction.

Exemption of Premiums from Income-Tax.—Under a recent Act of Parliament, the premiums paid by a person for an Assurance on his own life, or on the life of his wife, or for a deferred Annuity to his widow, are declared free from Income-tax, provided such premiums do not exceed one-sixth of his returnable income.

DWELLING-HOUSES.

The duty is 6d. in the pound in respect of dwelling-houses of £20 or upwards, occupied by any person in trade who shall expose to sale and sell any goods in any shop or warehouse, being part of the same dwelling-house, and in front and on the ground or basement storey thereof; or by a person licensed to sell therein, by retail, beer, &c.; or as a farmhouse by a tenant, or farm servant, and *bona fide* used for the purpose of husbandry only. The duty is 9d. in the pound for dwelling-houses not occupied and used for any of the purposes described in the preceding.

Exemption.—Market-gardens and nursery-grounds are not to be included in valuation of inhabited houses.

LEGACY DUTIES.

To children or their descendants, or lineal ancestors of the deceased ...	£1	0	0
Brother or sister, or their descendants ...	3	0	0
Uncle or aunt, or their descendants ...	5	0	0
Grand uncle or aunt, or their descendants	6	0	0
All other relations or strangers	10	0	0

The husband or wife of the deceased not chargeable. Probates and Letters of Administration are exempt, if the effects are under £100 in value.

CARRIAGES.

For every carriage having four or more wheels, weighing 4 cwt. or upwards	£2	2	0
If less than four wheels, or having four, and weighing less than 4 cwt ...	0	15	0

MALE SERVANTS.

For every male servant	£0	15	0

HORSES AND HORSE DEALERS.

For every horse or mule	£0	10	6
For every horse dealer	12	10	0

The above duties shall be paid by the person who shall employ the servant, or shall keep the carriage, or horse or mule, or shall exercise or carry on the trade of a horse dealer.

Exemptions.—Horses employed solely in agriculture. The Commissioners have decided, in a case appealed from Coldstream, that a horse unable to work, and turned out to grass, becomes liable to duty. Farmers do not pay the horse-dealers' duty as regards the sale of animals under five years of age stocked on the farm.

DOG LICENSES.

For every dog, of whatever description or denomination	£0	7	6

No exemption, except for dogs under six months old. Persons keeping dogs without a license are liable to a penalty of £5. The duty on dogs kept by shepherds is payable by the shepherd's master; but in case of default it has been decided that the penalty is recoverable from the shepherd only.

GAME LICENSES.

If License or Certificate be taken out after April 5, and before Nov. 1, to expire on April 5 in the following year ...	£3	0	0
To expire on Oct. 31 in the same year in which the License or Certificate shall be taken out	2	0	0
If License or Certificate be taken out on or after Nov. 1 to expire on April 5 following	2	0	0
To deal in Game	2	0	0

GUN LICENSES.

On and after the 1st April 1870, every person using a gun (save those paying game certificates; occupiers of lands, or those in their employ using a gun for scaring birds or killing vermin; persons in the naval, military, volunteer, or constabulary service; gunsmiths or their servants carrying guns for purposes of testing only; common carriers carrying guns in their ordinary business) must take out a 10s. license, under the penalty of £10.

The Post Office.

INLAND LETTERS to any part of the United Kingdom, not exceeding one ounce, 1d.

Exceeding		but not exceeding		
1 ounce,		2 ounces		1½d.
,,	2 ounces	,,	4 ,,	2d.
,,	4 ,,	,,	6 ,,	2½d.
,,	6 ,,	,,	8 ,,	3d.
,,	8 ,,	,,	10 ,,	3½d.
,,	10 ,,	,,	12 ,,	4d.

If a letter exceeds 12 oz. it will be charged 1d. per oz., beginning with the first oz.: thus, a letter weighing 12 oz. and not exceeding 13 oz. will be charged 1s. 1d., and so on. No limit exists to the weight of paid letters, but no inland letter must exceed 18 inches in length, 9 inches in width, and 6 in depth. All inland letters must be prepaid in stamps, except letters posted at the Chief Offices in London, Edinburgh, and Dublin, one hour before the closing of the mails, by one individual or firm collectively, postage of which amounts to £2 or upwards.

Unstamped Letters are charged double postage on delivery. If coin be enclosed in a letter, the letter will be charged double the fee of an ordinary Registered Letter.

REGISTERED LETTERS.—Inland Letters are charged 4d. Colonial letters, book-packets, &c., except those to Ascension, Vancouver, British Columbia, and Labuan, may be registered upon payment in money of a fee of 6d. over and above the postage. Letters only can be registered to certain foreign countries, but in many cases only to the port of despatch. Registered Letters must be posted half-an-hour previous to ordinary letters.

NEWSPAPERS from one Post Town to another within the United Kingdom are charged one halfpenny, with or without supplements. India, via Southampton, 2d. Newspapers to the Colonies, 1d.; *via* any foreign country, 2d.

BOOK POST. — A Book, or any number of Books or Printed Letters from one Post Town to another, within the United Kingdom, in a cover open at the ends, not exceeding 2 feet in length, and not exceeding 2 oz. in weight, is charged one halfpenny, and an additional halfpenny for every 2 oz., or fractional part of 2 oz. A Book-packet may contain any number of separate books or other publications (including printed letters and printed matter of every kind); but no written letter is allowed in any case.

The privileges of the Book Post are now extended to the whole of the British Colonies and Settlements. Packets to any part of Cape Colony other than Cape Town, Port Elizabeth, or Mossel Bay, must be addressed to the care of some one at either of these places.

THE SAMPLE POST—since the recent reduction of postage—has been abolished, except to the Colonies, and certain foreign countries.

MONEY ORDERS are granted and paid in the United Kingdom :—

	s.	d.
For sums under 10s. ...	0	1
,, of 10s. and under £1	0	2
,, £1 ,, 2	0	3
,, 2 ,, 3	0	4
,, 3 ,, 4	0	5
,, 4 ,, 5	0	6
,, 5 ,, 6	0	7
,, 6 ,, 7	0	8
,, 7 ,, 8	0	9
,, 8 ,, 9	0	10
,, 9 ,, 10	0	11
,, 10	1	0

No single Order is issued exceeding £10, and sums for fractions of 1d. not allowed. Money Orders are also granted to certain Post Towns in the British Colonies and to many Foreign Countries at an additional charge.

Payment of an Order must be obtained before the end of the second month, exclusive of the month the Order was issued in, or a fresh commission must be paid; under any circumstances an Order will not be paid after twelve clear months. In case of the miscarriage or loss of a Money Order, a duplicate is granted on a written application (with the necessary particulars, and enclosing the amount of a second commission in postage stamps) to the Comptroller of the Money Order Office of the Kingdom where the original Order was issued.

HALFPENNY POSTAGE.—Registered Newspapers, Book Packets, and Post Cards and Circulars (unsealed) may be sent by post between places in the United Kingdom, at the following rates of postage :—

On a registered newspaper, with or without supplement ...	One halfpenny.
On each registered newspaper in a packet of two or more ...	One halfpenny.
On a book packet:—If not exceeding 2 ozs. in weight ...	One halfpenny.
If exceeding 2 ozs. in weight, for every additional 2 ozs. or fractional part of 2 ozs. ...	One halfpenny.
On a post card	One halfpenny.

Provided that a packet of two or more registered newspapers, with or without a supplement or supplements, shall not be liable under this section to a higher rate of postage than the rate chargeable on a book packet of the same weight.

If any registered or other newspaper, supplement, publication, book-packet, or post card, is sent by post otherwise than in conformity with this Act, or any Treasury warrant, or Post Office regulations, it shall be either returned to the sender thereof, or forwarded to its destination, in either case charged with such rate of postage not exceeding the letter rate of postage, or without any additional charge, as the Postmaster-General, with the approval of the Treasury, from time to time directs, having been, if necessary, detained and opened in the Post Office.

The public are prohibited from using an embossed or impressed stamp separated from a cover or card, although such stamp has not been before sent by post.

TELEGRAPHS.

Telegraphic messages sent from all the principal offices, night and day, at a uniform rate of 1s. for twenty words, exclusive of name and address. Printed forms can be had at all the offices.

POST OFFICE SAVINGS' BANK.

By 24 Vic. cap. 14, deposits of one shilling, or of any number of shillings, or of pounds and shillings, will be received from any depositor at the Post Office Savings' Banks, provided the deposits made by such depositor in any year ending the 31st day of December do not exceed £30, and provided the total amount standing in such depositor's name in the books of the Postmaster-General do not exceed £150, exclusive of interest. When the principal and interest together standing to the credit of any one depositor amount to the sum of £200, all interest will cease, so long as the same funds continue to amount to the said sum at £200. Upon every pound yearly interest is given of the rate of £2, 10s. per cent.

The interest is calculated to the 31st December in every year, and is then added to, and becomes part of the principal.

THE MILES OF DIFFERENT NATIONS GIVEN IN ENGLISH YARDS.

Arabian mile	2,148
Bohemian mile	10,137
Brabant mile	6,082
Burgandy mile.........	6,183
Chinese lis	629
Danish mile	8,244
English mile	1,760
English mile, Geo.........	2,025
Flemish mile	6,869
French league	4,860
French marine league......	6,075
French legal league of 2000 toises	4,263
German mile, Geo.........	8,100
German mile, long	10,126
German mile, short.........	6,859
Hamburgh mile	8,244
Hanoverian mile.........	11,559
Dutch mile	6,395
Hungarian mile	9,110
Irish mile.........	2,240
Italian mile	2,025
Persian parasang.........	6,086
Poland mile, short	6,071
Poland mile, long	8,130
Portuguese legoas	6,768
Prussian mile	8,462
Roman mile, ancient	1,615
Roman mile, modern......	2,027
Russian verst	1,165
Saxon mile	9,904
Scotch mile	1,983
Silesian mile	7,086
Spanish leguas, common	7,415
Spanish leguas, legal	4,636
Swedish mile	11,703
Swiss mile	9,155
Turkey berries.........	1,826

Abstracts of Acts of Parliament.

ACTS OF PARLIAMENT RELATING TO SPORT AND RURAL PURSUITS.

(*Passed during the Reign of Queen Victoria.*)

Adulteration of Seeds, 32 & 33 Vict., cap. 112.
Agricultural Tenants' Fixtures, 14 & 15 Vict., cap. 25.
Agricultural Children, 36 & 37 Vict., cap. 67.
Agricultural Gangs, 30 & 31 Vict., cap. 130.
Agricultural Holdings, 38 & 39 Vict., cap. 92.
Cruelty to Animals, 12 & 13 Vict., cap. 92; 17 & 18 Vict., cap. 60; and 24 & 25 Vict., cap. 97.
Assurance of Cattle, 29 & 30 Vict., cap. 34.
Cattle Diseases (Ireland), 29 & 30 Vict., cap. 4; 33 & 34 Vict., cap. 36; 35 & 36 Vict., cap. 16; 37 & 38 Vict., cap. 6.
Inclosure of Commons, 8 & 9 Vict., cap. 188; 9 & 10, cap. 70; 10 & 11, cap. 111; 11 & 12, cap. 99; 12 & 13, cap. 83; 14 & 15, cap. 53; 15 & 16, cap. 79; 17 & 18, cap. 97; 20 & 21, cap. 30; 22 & 23, cap. 43; 26 & 27, caps. 18 & 39; 29 & 30, cap. 122; 30 & 31, cap. 20; 32 & 33, cap. 107; 34 & 35, cap. 93; 36 & 37, cap. 19.
Contagious Diseases (Animals), 29 & 30 Vict., cap. 35; 31 & 32 Vict., cap. 80; 32 & 33 Vict., cap. 70; 38 & 49 Vict., cap. 75.
Commutation of Tithes, 9 & 10 Vict., cap. 73; 14 & 15, cap. 53; 22 & 23, cap. 93.
Copyhold, 5 & 6 Vict., cap. 35; 6 & 7, cap. 23; 7 & 8, cap. 55; 13 & 14, cap. 53; 14 & 15, cap. 51; 21 & 22, cap. 94; 25 & 26, cap. 73; 31 & 32, cap. 89; 36 & 37, cap. 75.
Destructive Insects, 40 & 41, cap. 68.
Diseased Meat, 11 & 12 Vict., cap. 63; 18 & 19, cap. 121; 21 & 22, cap. 98; 26 & 27, cap. 117.
Dog Stealing, 24 & 25 Vict., cap. 96.
Dog Licences, 30 & 31 Vict., cap. 5.
Drainage of Land, 24 & 25 Vict., cap. 133; 26 & 27, cap. 88; 31 & 32, cap. 3; 32 & 33, cap. 72; 35 & 36, cap. 31; 37 & 38, cap. 32.
Exportation of Salmon, 25 & 26 Vict., cap. 10; 28 & 29, cap. 121; 33 & 34, cap. 33.
Fisheries (Oyster, Crab, and Lobster), 40 & 41 Vict., cap. 42.
Fisheries (Dynamite), 40 & 41 Vict., cap. 65.
Game Acts, 11 & 12 Vict., cap. 39; 23 & 24, cap 90; 25 & 26, cap. 114; 26 & 27, cap. 19; 37 & 38, caps. 11 & 35; 40 & 41, cap. 28.
Gardens in Town, 26 & 27 Vict., cap. 13.
Gun Licences, 33 & 34 Vict., cap. 57.
Gunpowder, 23 & 24 Vict., cap. 139; 24 & 25, cap. 130; 25 & 26, cap. 98; 38 & 39, cap. 17.
Horse Duties and Licences, 32 & 33 Vict., cap. 14; 33 & 34, cap. 32.
Horse Racing, 3 & 4 Vict., cap. 5.
Improvements of Lands (see Drainage), 27 & 28 Vict., cap. 114.
Inclosure of Fields, 3 & 4 Vict., cap. 31; 22 & 23, cap. 17; 23 & 24, cap. 55; 24 & 25, caps. 1 & 38; 25 & 26, caps. 47 & 94.
Inclosure Act Amendments, 20 & 21 Vict., cap. 31; 25 & 26, cap. 73; 26 & 27, caps. 18 & 39; 29 & 30, cap. 70; 31 & 32, cap. 89.
Land Tax, 32 & 33 Vict., cap. 14.
Lands Title and Transfer, 31 & 32 Vict., cap. 101; 32 & 33, cap. 116; 37 & 38, cap. 94; 38 & 39, cap. 87.
Land Tax Redemption, 16 & 17 Vict., caps. 74 & 117; 24 & 25, cap. 91.
Landlord and Tenant (Ireland), 33 & 34 Vict., cap. 49; 34 & 35, cap. 92; 35 & 36, cap. 32.
Lands Clauses Consolidation, 8 & 9 Vict., cap. 18; 23 & 24, cap. 106; 32 & 33, cap. 18.
Leases, 8 & 9 Vict, cap. 124; 12 & 13, cap. 26; 13 & 14, cap. 17; 19 & 20, cap. 120; 21 & 22, caps. 57 & 77; 40 & 41, cap. 37.
Leases and Settled Estates' Amendment, 37 & 38 Vict., cap. 33.
Leasehold Tenures (Ireland), 12 & 13 Vict., cap. 105; 31 & 32, cap. 62.
Liability for Injury by Dogs, 25 & 26 Vict., cap. 59; 26 & 27, cap. 100; 28 & 29, caps. 50 and 60; 30 & 31, cap. 116.
Malicious Injury to Property, 24 & 25 Vict., cap. 97.
Malt for Feeding, 27 & 28 Vict., cap. 9; 35 & 36, cap. 88; 32 & 33, cap. 85.
Markets and Fairs, 10 Vict., cap. 14; 21 & 22, cap. 98.
Night Poaching, 25 & 26 Vict., cap. 114.
Oyster Fisheries, 31 & 32 Vict., caps. 19, 45, & 53; 38 & 39, cap. 15; 39 & 40, cap. 91; 40 & 41, cap. 42.
Pollution of Rivers, 39 & 40 Vict., cap. 75.
Prevention of Poaching, 25 & 26, cap. 114.
Poisoned Grain, 26 & 27, cap. 113.
Poisoned Flesh, 27 & 28, cap. 115.
Protection against Dogs, 34 & 35, cap. 56.
Salmon Fisheries, 11 & 12, cap. 92; 13 & 14, cap. 80; 24 & 25, cap. 109; 25 & 26, cap. 97; 26 & 27, caps. 16, 50, and 114; 27 & 28, cap. 118; 28 & 29, cap. 121; 31 & 32, cap. 123; 32 & 33, cap. 9; 33 & 34, cap. 33; 35 & 36, cap. 88; 36 & 37, caps. 71 and 75; 39 & 40, cap. 19.
Sea Birds' Preservation, 32 & 33, cap. 17.
Seizure of Crops, 14 & 15, cap. 25.
Settled Estates, 8 & 9, cap. 56; 10 & 11, cap. 38; 19 & 20, cap. 120; 21 & 22, cap. 77; 33 & 34, cap. 56; 34 & 35, cap. 84; 37 & 38, cap. 33; 39 & 40, cap. 30; 40 & 41, cap. 18.
Tenants' Holdings (Ireland), 33 & 34, cap. 46; 35 & 36, cap. 32.
Wild Birds' Protection, 35 & 36, cap. 78.
Wild Fowl Preservation, 39 & 40, cap. 29.

⁂ The various Acts of Parliament may be obtained from Messrs Eyre, Spottiswoode, & Co., East Harding Street, Fetter Lane, E.C., at a charge of 1½d. per sheet of four pages. Local and Private Acts are charged 3d. per sheet of four pages.

THE CONTAGIOUS DISEASES (CATTLE) ACT, 1878.

Vic. 41 & 42, cap. 74.

The laws relating to the importation and slaughter of infected and diseased cattle had been for some time in an uncertain and unsatisfactory condition when the Contagious Diseases Bill was introduced by the Government to the House of Lords. In its original form it absolutely prohibited importation from countries where disease was chronic, and made the most stringent regulations for slaughtering, isolation, &c. Passing the Lords almost unscathed, the Bill met with strong opposition in the Lower House, where the interests of the great ports are largely represented. This opposition, coming from supporters of, as well as from the opponents of, the Government, led to a compromise, whereby powers of almost unlimited extent were placed in the hands of the Privy Council. The countries whence cattle might be imported, the duration of prohibitions, the slaughtering of diseased animals, the inspection of suspected places, all these points were left to the settlement of the Privy Council. As the result of these powers, the Privy Council issued five orders which contain in themselves the whole duty of the farmer and the importer on the subject. The possession of these orders is absolutely necessary to every cattle farmer. They will be found in the pages of THE FARMER.

THRASHING MACHINES ACT.

Vic. 41, cap. 12.

By this Act, which does not extend to Scotland or Ireland, and which does not come into force until the 1st of August 1879, it is enacted (*a*) that the drum and feeding mouth of every thrashing machine as defined by this Act shall, at all times during the working thereof, be kept sufficiently and securely fenced so far as is reasonably practicable and consistent with the due and efficient working thereof; (*b*) a penalty, not exceeding £5, will be incurred on summary conviction of the breaking of this Act; (*c*) on the prosecution of any person for an offence against this Act he may, on his own application, be sworn and examined as a witness; (*d*) any constable may at any time enter on any premises on which he has reasonable cause to believe that a thrashing machine is being worked contrary to the provisions of this Act, for the purpose of inspecting such machine; (*e*) in this Act "thrashing machine" means a thrashing machine which is worked by steam or by any motive power other than manual labour.

PROTECTION OF FRESH-WATER FISH ACT.

Vic. 41 & 42, cap. 39.

By this statute, which comes in force with the new year, it is enacted as a preliminary that the Act shall not extend to Scotland or Ireland, nor except as regards sub-sections 4 and 5 of sect. 11, and as regards sect. 12 to the counties of Norfolk and Suffolk and the county of the city of Norwich. The material sections are as follows:—Sect. V.—Sections of the Salmon Fishery Act, 1861, which relate to fishing with lights, spears, and other prohibited instruments, and to using roe as a bait, and which provide a close time for trout and char, shall, as amended by the subsequent Salmon Fishery Acts, apply to trout and char in all the waters within the limits of this Act, and the term "salmon river," as used in sect. 64 of the Salmon Fishery Act, 1865, shall include any such water. Sect. VII.—In any fishery district, subject to a board of conservators, the conservators shall have power to issue licenses for the day, week, season, or any part thereof to all persons fishing for trout or char, and in the event of the power being exercised in any fishery district, the provisions of the 33d, 34th, 35th, 36th, and 37th sections of the Salmon Fishery Act, 1865, and of the 21st, 22d, 24th, and 25th sections of the Salmon Fishery Act, 1873 (relative to licenses), shall, with respect to such district, be construed as if the words "trout or char" were inserted throughout after the word "salmon," provided as follows:—1, A license to fish for salmon shall have effect as a license to fish for trout and char; 2, the fee payable for a license to fish for trout or char, exclusively of salmon, in any district, shall not exceed one-third of the maximum amount chargeable for fishing for salmon under the provisions of the 21st section of the Salmon Fishery Act, 1873. Sect. II.—1. In this section the term "fresh-water fish" includes all kinds of fish (other than pollan, trout, and char) which live in fresh water; except those kinds which migrate to or from the open sea. 2. The period between the 15th March and 15th June, both inclusive, shall be a close season for fresh-water fish. 3. If any person during this close season, fishes or catches, or attempts to catch or kill, any fresh-water fish in any river, lake, or stream, he shall, on summary conviction before two justices, be liable to a fine not exceeding 40s. Nothing in this sub-section shall apply—(*a*) To the owner of any several or private fishery where trout, char, or grayling are specially preserved, destroying within such fishery any fresh-water fish other than grayling (*b*); to any other person angling in any several fishery with the leave of the owner of such fishery, or in any public fishery under the jurisdiction of a Board of Conservators with the leave of said Board; (*c*) to any person taking fresh-water fish for scientific purposes; (*a*) to any person taking fresh-water fish for use as bait. 4. If any person during this close season buys, sells, or exposes for sale, or has in his possession for sale, any fresh-water fish, he shall, on summary conviction before two justices, be liable to a fine not exceeding 40s. 5. On a second or any subsequent conviction under this section, the person convicted shall be liable to a fine not exceeding £5. 6. After every conviction under this section the person or persons convicted shall forfeit all fish so caught, bought, sold, exposed for sale, or in possession for sale, and shall be liable, at the discretion of the convicting justices, to the forfeiture of all instruments used in the taking of such fish. 7. A Board of Conservators, appointed under the Salmon Fishery Acts, 1861-76, or under this Act, may, as regards any or all kinds of fresh-water fish, with the approval of the Secretary of State, exempt the whole or any part of their district from the operation of the 1st, 2d, and 3d sub-sections of this section; the exemption shall be adverstied in such manner as the Secretary of State shall direct. 8. The provisions of the Salmon Fishery Acts, 1861-76, as to legal proceedings, offences, and penalties under those Acts, shall apply to legal proceedings, offences, and penalties under this section. Sect. XII.—The Fisheries (Dynamite) Act, 1877, which prohibits the use of explosives for the catching or destruction of fish in a public fishery, shall apply to the use of any such substance for the catching or destruction of fish in any water, whether public or private, within the limits of this Act.

ADULTERATION OF SEEDS ACT.

Vic. 41, cap. 17.

This statute, which became law on the 27th May 1878, enacts that "from and after the passing of this Act, sect. 2 of the Adulteration of Seeds Act, 1869, shall be read as if, instead of the words 'the term to dye seeds means to give to seeds by any process of colouring, dyeing, sulphur smoking, or other artificial means, the appearance of seeds of another kind,' there were therein inserted the words 'the term to dye seeds means to apply to seeds any process of colouring, dyeing, or sulphur smoking.'"

The practical effect of these rather recondite sentences is to increase the stringency of the Act of 1869.

VOTING FOR MEMBERS OF PARLIAMENT.

Boroughs.—1. Every man is entitled to vote for a member or members for boroughs, who is of full age and not subject to any legal incapacity, and who has occupied a dwelling-house for twelve months within the borough, and who, by July 20th, has paid the full poor-rates due on January 5th. 2. Lodgers who have been sole tenants for twelve months, in lodgings of a yearly value, if let unfurnished, of ten pounds.

Counties.—1. Every man who is a holder for life of lands of the clear yearly value of five pounds net. 2. The occupier, as owner or tenant, of lands or tenements of the rateable value of twelve pounds.

No elector is entitled to vote who has been employed as agent, canvasser, &c., for reward for any purposes of an election within six months before an election.

At a contested election for any county or borough represented by three members, no person shall vote for more than two candidates. At a contested election for the city of London, no person shall vote for more than three candidates. The residence of electors for the city of London is extended to twenty-five miles.

The claim of every person desirous of being registered as a voter for a borough, in respect of occupation of lodgings, to be delivered to overseers between August 1st and August 25th.

THE BALLOT ACT, 1872.

Nomination.—In place of the system of nomination at the hustings, the following method has been substituted :—Candidates for counties and boroughs are to be nominated in writing. The writing is to be subscribed by two registered electors as proposer and seconder, and by eight other registered electors as assenting to the nomination.

The Poll.—Votes must be given by ballot. The ballot paper must shew the names and descriptions of the candidates, and must have a number printed on the back, and have attached to it a counterfoil with the number printed upon the face. The voter, having received his paper, must proceed to one of the compartments in the station, and with the pencil provided in the compartment, secretly place a cross on the right-hand side, opposite the name of the candidate for whom he votes, thus X. He must then fold up the ballot paper so as to conceal his vote, but so as to shew the official mark at the back. After having shewn the presiding officer the official mark at the back, the voter must place his ballot paper, in the presence of such officer, in the ballot box.

Miscellaneous Provisions.—The "local authority" of every county must, by order, divide the county into polling districts, and assign a polling place to each district, so that, as far as practicable, every resident elector in the county shall have a polling place within four miles. The local authority of every borough, if they think fit, may, by order, divide the borough into polling districts in the most convenient manner. The returning officer at a parliamentary election may use, free of charge, for the purpose of the poll, any room in a school receiving a grant out of moneys provided by Parliament.

Criminal Provisions.—Every person who (1) forges or fraudulently defaces or destroys any nomination paper, or delivers to the returning officer any nomination paper, knowing the same to be forged ; or (2) forges or fraudulently destroys any ballot paper, or the official mark on any ballot paper ; or (3) without due authority supplies any ballot paper to any person ; or (4) fraudulently puts into any ballot box any paper other than his proper ballot paper ; or (5) fraudulently takes out of the polling station any ballot paper ; or (6) without due authority, destroys, takes, opens, or otherwise interferes with any ballot box, or packet of ballot papers then in use for the purposes of the election ; shall be guilty of a misdemeanour, and be liable, if he is a returning officer, or an officer or clerk in attendance at a polling station, to imprisonment for two years, with or without hard labour, and if he is any other person, to imprisonment for six months, with or without hard labour. Any attempt to commit any of the above offences is punishable in the same manner as the offence itself.

LODGERS' GOODS PROTECTION ACT.

If any superior landlord shall levy a distress on any furniture or chattels of any lodger for arrears of rent due to superior landlord by his immediate tenant (that is, the occupier of the house), the lodger may serve the superior landlord or the bailiff with a declaration in writing, stating that the immediate tenant has no right of property in the furniture or chattels so distrained upon, and that such furniture or chattels are in the lawful possession of such lodger ; and also setting forth whether any and what rent is due from the lodger to his immediate landlord ; and such lodger may pay to the superior landlord or the bailiff the rent, if any, so due. Any lodger making such declaration, knowing the same to be untrue, shall be deemed guilty of a misdemeanour.

If any superior landlord or any person employed by him shall, after being served with the before-mentioned declaration, and after the lodger shall have paid or tendered the rent, if any, which the lodger is authorized to pay, proceed with a distress on the furniture or chattels of the lodger, such superior landlord or bailiff shall be deemed guilty of an illegal distress, and the lodger may apply to the justice of the peace for an order for the restoration to him of such goods.

INTESTATE ESTATES OF SMALL VALUE.

In the Session of 1873 an Act was passed (36 and 37 Vict., cap 52) for the relief of widows and children of intestates where the personal estate is of small value, by which it is provided that where the whole estate and effects of an intestate shall not exceed in value the sum of £100, his widow or any one or more of his children, provided such widow or children respectively shall reside at a distance exceeding three miles from the Registry of the Court of Probate having jurisdiction in the matter, may apply to the registrar of the county court within the district of which the intestate had his fixed place of abode at the time of his death, and the said registrar shall fill up the usual papers required by the Court of Probate to lead to a grant of letters of administration of the estate and effects of the said intestate, and shall swear the applicant and attest the execution of the administration bond according to the practice of the Court of Probate, and shall then transmit the said papers by post to the registrar of the Court of Probate having jurisdiction in the matter, who shall in due course make out and seal the letters of administration of the estate and effects of the said intestate, and transmit them by post to the said registrar of the county court, to be by him delivered to the party so applying for the same, without the payment of any fee for the same save as is provided by this Act.

The registrar of the county court may require such proof as he may think sufficient to establish the identity and relationship of the applicant.

If the registrar of the county court has reason to believe that the whole estate and effects of which the intestate died possessed exceeds in value £100, he shall refuse to proceed with the application until he is satisfied as to the real value thereof.

The provisions of this Act shall apply to Ireland, as well as to England, but not to Scotland.

The fees payable are 5s. where the estate does not exceed £20 in value, and 1s. for every £10 additional or fractional part thereof. For an estate of £50 in value, therefore, the fees will amount to 8s.; and 13s. if the estate is valued at £100.

MARRIED WOMEN'S PROPERTY ACT.

The wages and earnings of any married woman, in any employment in which she is engaged, or which she carries on separately from her husband, and all investments of such earnings, are to be property held to her separate use, independent of her husband, and her receipts alone shall be a good discharge for such earnings.

Any married woman can now make an investment in the public funds; or in any incorporated or joint-stock company; or in any duly registered friendly, provident, building, benefit, or loan society, in just the same way as if she were unmarried.

Deposits in savings'-banks (not the moneys of the husband) by a married woman are to be her separate property.

Where any woman shall during her marriage become entitled to any personal property, such property shall belong to the woman for her separate use.

A married woman may effect a policy of insurance on her own life, or the life of her husband, for her separate use.

A married woman may maintain an action.

A husband shall not be liable for the debts of his wife contracted before marriage; but the wife shall be liable to be sued, and any property belonging to her for her separate use shall be liable to satisfy such debts, as if she had continued unmarried.

A married woman having separate property is to be liable to a parish on her husband becoming chargeable; and there is a similar provision as to the children of a married woman, as a widow is now by law subject to for the maintenance of her children; but the Act is not to relieve the husband of a married woman from any liability at present imposed on the husband by law to maintain her children.

This Act does not extend to Scotland.

Since the passing of the above Act (in 1870), several modifications were found necessary, and an Act was passed in 1874 to amend it.

The preamble of this Act states that it is not just that the property which a woman has at the time of her marriage should pass to her husband, and that he should not be liable for her debts contracted before marriage; and, further, the law as to the recovery of such debts requires to be amended. The Act has immediate operation in the United Kingdom, with the exception of Scotland. So much of the Married Women's Property Act, 1870, is now repealed as declares a husband shall not be liable for the debts of his wife contracted before marriage, after the passing of this Act, and a husband and wife married after this Act may be jointly sued for any such debt. The extent of the liability of a husband is defined by the new law. The husband in such action, or in an action for tort committed by his wife before marriage, or for breach of contract, is to be liable only to the extent of the assets specified; or, confessing his liability to some extent, he is not liable beyond what he confesses, and if no such plea is pleaded, the husband is to be deemed to have confessed his liability so far as assets are concerned. If it is not found that the husband is liable in respect of assets, he is to have judgment for his costs of defence, whatever the result of the action may be against the wife. When a husband and wife are sued, the judgment to be a joint one to the extent of the liability of the husband, and for the residue to be separate against the wife. Assets in respect to which a husband is liable are specified, consisting of the value of personal estate in possession of the wife, vested in the husband, rents, property transferred, or property made over to delay or defeat creditors, &c.

THE RATING ACT.

This Act amends the law respecting the liability and valuation of certain property for the purposes of rates. The statute, which is not to apply to Scotland or Ireland, abolishes exemptions in the Poor Law Act of the 43d of Queen Elizabeth, and provides that after the commencement of this Act the Poor Rate Acts shall extend to land used for a plantation or a wood, or for the growth of saleable underwood, and not subject to any right of common, to rights of fowling, of shooting, of taking or killing game or rabbits, and of fishing, when severed from the occupation of the land, and of mines of every kind not mentioned in the recited Act, with provisions as to the valuation of such property, and also as to the reduction of the rates by lessees and others. The property now specified is to be liable to all other local rates as well as to poor rates. For the purpose of enabling any hereditament to be included or omitted in a new valuation list, the Act is to take effect on the 6th of April 1875.

Hints on Tenancy.

OBSERVE if any windows are broken, as, otherwise, the tenant can be compelled to mend the same, even though they may not be whole when he took possession.

When there is no mention of time of payment of rent, the law presumes payment to be quarterly.

See the receipts of payment of the last rates and taxes, as if not paid, you will be liable.

The above applies to Imperial taxes; parochial and local rates you are not liable for, although the collectors will usually tell you that you are liable.

An agreement to pay "all taxes" does not charge the tenant with Income or Property Tax.

When any agent has been duly authorized to collect rent, a receipt from him for any subsequent rent acquits the tenant, whether the agent defraud the landlord or no. But if the landlord warns the tenant against an agent, the tenant pays him at his own peril.

Be careful of your last quarter's receipt for rent, for the production of it bars all prior claims—even arrears due on former quarters.

Verandahs or summer houses, where the lower parts are attached to posts fixed in the soil, cannot be removed by a tenant; he may, however, remove any building resting upon, but not let into, a brick foundation.

No tenant can give notice in any part of a quarter that he will quit that day three months.

A covenant in a lease not to assign, does not prevent an under-lease for part of the term.

This part of the term may last to the very day before the expiry of the original lease, but the under-lease must not be coterminous with the original lease.

In case of bankruptcy, no more than one year's rental is obtainable by distress; if more be due, the landlord is only entitled to come in with the rest of the creditors, for the further sum due.

Corn sent to a mill to be ground, may not be distrained by the landlord of the mill.

When cattle are feeding on the land of a farmer whose property is distrained, they may be seized; though if on their way to market, and turned in for rest and refreshment only, they are protected.

Mill-stones cannot be distrained.

Beasts of the plough and sheep are exempt from seizure while other distress can be obtained.

A landlord is authorized to seize, as a distress for arrears of rent, all sorts of corn, grass, hops, fruits, and other product whatever, if growing on the property. He may cut the grain, and cure the hops, when ripe, in the barn or other proper place on the premises; and if there be no barn or other place which he shall procure as near to the premises as may be; and when convenient, sell the same to satisfy the rent and charges.

The appraisement of value is to be made when the grain is garnered, the hops cured—*not before.*

The tenant has a week to pay money and have the grain back.

The breaking of the padlock on a barn-door is an illegal distress, but if the outer door be opened, any inner compartments may be broken down with impunity.

A distress may be taken through an open window, but it is illegal to open the window, even though it is unfastened.

It is a popular error that only four weeks' rent can be recovered from weekly tenants, only four months' rent from monthly tenants, and only four quarters' rent from quarterly tenants.

A tenant should remember that though he take a house when out of repair, yet he is bound to leave it in repair.

A tenant may convert a meadow into a hop ground, but not into a orchard. The latter is technically waste.

A corn mill cannot be converted into a fulling mill without impeachment of waste.

The firing of a house by lightning, or its destruction by a hurricane, do not fall on the tenant; though if the roof only be blown off, he must replace it.

Agricultural Societies.

NOTE.—*Secretaries will greatly oblige the Publisher by sending any alteration.*

ENGLAND.

1. THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.—Instituted 1838. Secretary—H. M. Jenkins, 12 Hanover Square, London, W. Holds an Annual Show in July.

2. THE BATH AND WEST OF ENGLAND SOCIETY AND SOUTHERN COUNTIES ASSOCIATION.—Secretary—J. Goodwin, Bath. Holds an Annual Show in June or July.

3. YORKSHIRE AGRICULTURAL SOCIETY. — Holds Show in August. Secretaries—Thomas Parrington, and M. Stephenson, Helmsley, York.

4. THE SMITHFIELD CLUB. — Hon. Secretary—B. T. B. Gibbs. Acting Secretary—D. Pullen, 90 Piccadilly. Holds an Annual Show of Fat Stock in the New Agricultural Hall, Islington.

5. THE BIRMINGHAM AGRICULTURAL EXHIBITION SOCIETY is held at Birmingham in November. Secretary—J. B. Lythall.

6. THE DAIRY SHOW is held at the Agricultural Hall, London, in May. Secretary—R. Dale.

7. OAKHAM CATTLE SHOW is held at Oakham in November, the week before the Birmingham Show. Hon. Secretary—E. Wortley, Ridlington, Uppingham.

8. AGRICULTURAL HALL COMPANY (Limited) HORSE SHOW.—Secretary — Samuel Sidney, Islington, London, N.

9. CANTERBURY CATTLE SHOW.—Secretary—Geo. Slater. Canterbury.

10. EDENBRIDGE FAT STOCK.—Secretary—Fred. Stanford, Kent.

Alford—J. Higgins, Louth.
Allendale—J. Walton.
Andover—T. Lamb, Andover.
Bakewell—W. Smith, Bakewell.
Banbury—B. W. Aplin.
Bedfordshire—J. Rogers, Bedford.
Bellingham—G. Dixon, Dunterlea.
Bicester—W. J. Attenbrow, Bicester.
Blackpool & Fylde—R. Gorst, Blackpool.
Boroughbridge—C. Clarke, Heaton House.
Botley—C. Holdaway.
Bramston—J. D. Brailey, North Devon
Braywith, Knayton, &c.—
Bridgnorth—R. Taylor.
Brighton—J. Heasman, Angmering.
Broomyard—J. Eckley.
Bury—H. Marden, Bury.
Buxton—T. Taylor, Buxton.
Caistor—W. Torr, Aylesbury.
Callington—J. Clemence, Callington.
Cambridgeshire and Vale of Ely—A. T. Grain, Cambridge.
Carmarthenshire—D. Prosser, Carmarthen.
Carlisle—T. James, Carlisle.
Caston—G. Osborne.
Chertsey—W. Kemper, Chertsey.
Cheshire—W. Beckett, Tarporley.
Chichester—E. Wyatt.
Chippenham—E. Little, Lawhill.
Cleveland—T. G. Fawcett, Stockton-on-Tees.
Coggeshall—J. C. Raven.
Craven—M. Robinson.
Crook—T. Pickering, Crook, *via* Darlington.
Cumberland—G. Smith, Penrith.
Darlington—J. Hodgson.
Derbyshire—G. Corbett, Canal Office, Derby.
Devon County — John L. Winter, Bridgetown, Totnes.
Doncaster—G. Chafer, Doncaster.
Donnington—C. Fielden, Belmont.
Dorchester—G. J. Andrews.
Dover—G. Easter, Beere Farm, Dover
Downham—T. L. Reid.
Driffield and East Riding—J. Turner, Great Driffield.
Dunmow—A. Barfield.
Durham—T. Wetherell, Durham.
Easingwold—J. H. Dee.
East Berks—W. Bulstrode, Maidenhead.
East Cornwall—C. Childs, Liskeard.
East Cumberland—T. James.
East Derbyshire and Norton Farmers' Club—J. N. Jephson, Chesterfield.
East Surrey—T. Richards, Croydon.
Essex—R. Emson, Slough, Halstead.
Felton—J. Donkin.
Freshwell—A. T. Baker, Wethersfield.
Freyrigs—A. W. Long.
Gloucester—E. Trinder, Cirencester.
Glamorganshire — W. V. Huntley, Cowbridge.
Grantham—W. Wagstaff, Grantham.
Great Budworth—R. Hornby, Aston Park.
Halifax and Calder Vale—W. Irvine, Halifax.
Harlow—C. L. Corfield.
Harrogate—J. Powell, Harrogate.
Hemelhempstead—T. Stallon.
Hereford—J. F. O. Fowler, Hereford.
Herts—G. Passingham, Bengeo.
Horncastle—H. Griffin, Ashby.
Hundred of Clackclose—T. L. Reed, Downham Market.
Huntingdon—J. Dilley, Huntingdon.
Ireby—G. Bell, Ireby, Wigton.
Isle of Thanet—T. Hooper, Chilton.
Keighley—J. Whitley, Keighley.
Kendal—F. C. Ellison, Kendal.
Kent—C. J. Cooke, Maidstone.
Kirkby Lonsdale—W. Warriner.
Lamport—A. Watson, Lamport.
Lancaster—
Launceston—R. Gubbins, Launceston
Ledbury—W. Stallard, Brocklehampton
Leicester—J. T. Ardron, Leicester.
Leominster—E. Gregg, Leominster.
Lewes—E. Davey.
Leyland—F. W. Read, Walton-le-dale
Lincoln—S. Upton, Lincoln.
Longhorn—J. B. Lythall.
Long Sutton—J. Clarke, Long Sutton
Loughborough—D. Cartwright.
Louth—J. Wilson, Louth.
Ludlow—T. Weyman, Ludlow.
Lutterworth—
Lytham and Kirkham—J. Parkinson, Preston.
Maidenhead—W. Bulstrode.
Malpas and Whitchurch—W. Brittain
Mansfield—C. Revel, Mansfield.
Market Drayton—W. H. Green.
Marlborough—W. Merriman.
Melksham—P. Phelps.
Melplaish—W. G. Pope, Bridport.
Middlesex—J. Gotelee, Hounslow.
Milnthorpe—W. Talbot, Lane House.
Montgomeryshire—D. T. Owen and W. Withby, Welch Pool.
Morpeth—J. Anderson, Cottingwood.
Nantwich—T. Mannach, Acton.
Newmarket—C. Clarke.
Norfolk—J. Bacon, Attleborough.
Norfolk and Norwich (Christmas)—Mr Euren, *Mercury* Office, Norwich.
Northampton—J. Lovell, Harpole.
Nth Bucks—G. Burnett, Buckingham.
North-East Somerset — J. Tudball, Chew Magna, near Bristol.
North Hants—H. Downs, Basingstoke
North Herts—C. Austin, Luton.
Northamptonshire — J. M. Lovell, Weedon.
North Lincolnshire—J. Hett, Brigg.
North Lonsdale—T. Postlethwaite.
North Tyne—G. Dixon, Bellingham.
Northumberland—J. Wilson, Morpeth
North Walsham—R. Atlee, Didham.
Northern Counties—J. Hodgson.
North-west Bucks—G. Bennett.
Ollerton—Hy. Horncastle, Edwinston
Ongar—G. Sworder.
Ormskirk and Southport—John Brown Ormskirk.
Orsett—Rev. W. Brunton, Ranford.
Oswestry—T. Whitfield.
Over—T. Rigby, Winsford.
Oxfordshire—T. F. Plowman, Oxford.
Papplewick—S. Mellors.
Penrith—T. Bowstead, Beck Bank.
Penwith—E. Rowe, Penzance.
Peterborough—J. E. Little, Peterborough.
Plympton—J. Hardy, Plymouth.
Pontefract—T. Crawshaw, Pomfret.
Preston—T. Nevett, Preston, Lancashire.
Richmondshire—J. Wetherell, Richmond (Yorks.)
Ringwood—H. Bone.
Ripon—S. Scott, Broom Close.
Rochdale—J. Taylor, Rochdale.
Romsey—B. Oakley.
Roothings—Rev. H. Sheppard.

Ross—C. Cadle.
Royal Counties, Hants and Berks—H. Downs, Basingstoke.
Royal and Central Bucks—G. Fell, Aylesbury.
Royal North Lancashire—G. and F. G. Hunt, Preston.
RoyalCornwall—H.Tresawna, Probus.
Royal Manchester and Liverpool and North Lancashire—T. Rigby, Corn Exchange, Liverpool.
Royal Jersey (Agri-Horti.)—Francis Labey, Le Patriemoine, Jersey.
Royston—H. Turnall, Royston.
Rutland—E. Wortley, Ridlington, Uppingham.
Ryedale and Pickering—George Frank Kirkby Moorside.
Shorthorn—H. J. Hine, 12 Hanover Square, London.
Shropshire and West Midland—W. L. Browne, Shrewsbury.
Sleaford—J. Bellamy, Sleaford.
Snaith—E. A. Rhodes.
South Bucks—C. P. Barrett, Eton.
South Devon—L. J. Oldreive, Totnes.
South Durham and North Yorkshire (Horses and Dogs)—W. Sewell, Darlington.
South Tyne—J. Nixon, Haltwhistle.
Spalding—W. Hunt, Deeping St James
Sparkenhoe—T. Davenport, Ashby-de-la-Zouch.
Staffordshire—W. Tomkinson, Newcastle-under-Lyne.
Stanhope—W. Morley, Stanhope.
Stow-on-the-Wold—J. Sewell.
Suffolk—R. Bond, Ipswich.
Sussex—E. Carpenter.
Tarporley—W. Vernon, Tarporley.
Tavistock—J. S. Spence.
Thirsk—G. Freeman, Thirsk.
Torrington—G. Arnold, Dolton.
Towcester— Henry Osborne, Pattishall
Tredegar—J. G. Palling, Newport.
Trigg—P. Wallis, Bodmin.
Tring—W. Brown.
Tyneside—A. Wood, Broxbushes.
Uske—J. H. Clarke.
Vale of Evesham—A. Hubard, Evesham
Warwickshire—J. Moore, Warwick.
Waterford—R. S. Blee, Waterford.
Wayland—R. Robinson, Watton.
Wellingbro'—J. W. Sharman.
Weobley—T. C. Bull.
Wensleydale —G. W. Wray, Leyburn.
West Cumberland — R. Jefferson, Preston House.
West Devon—J. Spence, Morwelham.
West Surrey—J. Steel, Epsom.
West Sussex—E. Wyatt.
Wetherby—J. Powell.
Whitby—W. Stonehouse, Whitby.
Whitehaven—
Wigton—R. Harrison, Wigton.
Winchcombe—W. F. Harvey.
Windermere—W. H. Heelis.
Wirral—A. F. Gardiner, Birkenhead.
Wolsingham—William Rutter.
Woodstock—H. Turner.
Worcester—Albert Buck, Worcester.
Worsley and Swinton—A. Spencer, Worsley.
Zelton —R. Donkin, Acklington.

SCOTLAND.

1. The Highland and Agricultural Society of Scotland.— blished 1784. Sanctioned by Royal Charter 1787. Secretary—Fletcher N. Menzies. 3 George IV. Bridge, Edinburgh. Holds an Annual Show in August.

2. Edinburgh Christmas Club.—Established 1867. Holds Show of Fat Stock, Poultry, Roots, &c., in December. Secretary—Hugh Martin, S.S.C., Hope Street, Edinburgh.

Angus—J. L. Gordon, Brechin.
Ardrossan—J. Campbell, Saltcoats.
Auchindoir, Kildrummy, and Towie—W. Walker, Ardhuncart, Mossat.
Auchterarder—A. G. Reid.
Auchtermuchty—H. W. Walker, Tee.
Avondale—W. Lambie, of Hallburn, Strathaven.
Ayrshire—James M'Murtrie, Ayr.
Badenoch—D. Stewart, Biallid.
Banffshire (United)—George Cuming.
Barrhead—W. Pollock, Barrhead.
Bathgate—G. M. Johnston, Bathgate.
Black Isle — G. Gillanders, Rosemarkie, Fortrose.
Border Union—J. Usher, Kelso.
Bothwell—R. Bruce, Uddingston.
Breadalbane—J. Holmes, Kenmore.
Broughton—J. Wilson, jun., Burnetland, Biggar.
Buchan—J. Ferguson, Coynach.
Buchan (Poultry)—R. Scott, Yokieshill, Mintlaw.
Buchlyvie—A. Dunn, Kepdowrie.
Bute—J. T. Wilson, Rothesay.
Cadder—J. Marshall, jun., 168 St Vincent Street, Glasgow.
Caithness—J. Brims and J. Purves.
Calder Water—J. Pender, Springhill.
Carluke—J. M'Gill, Carluke.
Carmunnock —W. Fleming, Muirside.
Carrick—David Brown, Maybole.
Clackmannanshire—J. Bleloch, Hazleyshaw, Alloa.
Cluny—J. J. Fyffe, Cluny.
Coldstone and Migvie—Dr Robertson, Indego, Tarland.
Crieff—J. M'Laren, Crieff.
Cromar, Upper Dee, and Donside—J. Charles, Tarland.
Culross—R. Bennet, Crockmuirhall, Culross.
Cumnock—J. Murray, jun., Cumnock.
Cupar—W. Dingwall, Ramornie.
Dalkeith—J. Wilson, Dalkeith.
Dalry—R. Craig, Flashwood, Dalry.
Drymen—A. Wyllie, Camstraddon.
Dumbarton—J. Dewar, Dumbarton.
Dunblane, Doune, and Callander—A. Kinross, Whitestown.
Dunning—W. Bruce, Dunning.
Dunoon—A. Mitchell, jr., Dunoon.
Eastern District of Stirlingshire—T. Binnie, Falkirk.
Ebrieside—
Elgin—J. Ferguson and W. Macdonald.
Eskdale—A. Stevenson, Langholm.
Fochabers—
Formartine — A. Davidson, Cairnbrogie.
Fyvie—W. Ironside, Petty, Fyvie.
Galston—R. Hendrie, Drumdroch.
Garioch (Turnip)—J. Stephen, Conglass, Inverurie.
Girvan—W. Brown, Girvan.
Glasgow—John Dykes, jr., Glasgow.
Glen Urquhart—
Hamilton, Blantyre, and Cambuslang—J. C. Forrest, Hamilton.
Helensburgh—R. D. Orr, Helensboro.
Inverness—Hugh Fraser, Culloden.
Inverurie—A. S. M'Lean, Inverurie.
Keig (Poultry and Dairy Produce)—G. Bruce, Keig, Aberdeen.
Kilbride, East—W. Hay, East Kilbride
Killearn—J. Thomas, Glasgow.
Kilfinan—W. Anderson, Ballimore, Tighnabruich.
Kilmarnock—J. Wilson, Kilmarnock.
Kinross-shire—J. Beveridge, of Balado, Kinross.
Kincardine, O'Neil, and Upper Deeside—A. Niven, Craigmyle Mills, Torphins.
Kinnethmont—W. Gerrard, Schoolhouse, Kinnethmont.
Kinglassie—D. Beath, Leslie.
Kintyre—T. Brown, Campbeltown.
Kirkintilloch—J. Hutchison, Glasgow.
Kirkmaden —G. R. Murray, Chapelrossan, Stranraer.
Lanarkshire—W. Munro, Hamilton.
Lauderdale—T. Broomfield, Lauder.
Leochel-Cushnie—H. Shaw, Bogfern, Tarland.
Lews—William Mackay, Stornoway.
Lochaber—
Loudoun—H. Morton, Newmills.
Lower Ward of Renfrewshire—D. L. Macadam, Greenock.
Forres (Fat Cattle)—R. H. Harris, Earnhiil.
Machars of Galloway—J. M'Lean.
Mar—S. Campbell, Kinnellar.
Mearns—Patrick Dickson.
Middle District of Athole and Tullymet—D. Macdonald, Ballinluig.
Midlothian—J. Hislop, Midcalder.
Mauchline—J. Thomson, Mauchline.
Muirkirk—A. Donald, Muirkirk.
Nairnshire—J. Joss, Budgate.
New Monkland—J. Henry, Airdrie.
Nithsdale—Dr Russell, Thornhill.
North-East Aberdeenshire—J. Bell, Merryhillock, Fraserburgh.
Northern Counties Fat Show—John Cran, Kirkton, Inverness.
Orkney—M. Calder and R. Arnot.
Peebles—
Penicuik—J. Alexander.
Perth—M. Jamieson, Perth.
Renfrewshire — R. L. Henderson, Paisley.
Renfrewshire, Lower Ward of—D. L. Macadam, Greenock.
Royal Northern—A. Yeats, Aberdeen.
Sanquhar—W. O. Macqueen, Sanquhar.
Shetland—John Walker, Bressay.
Sorn—T. Traill, Sorn, Mauchline.
Spey, Avon, and Fiddochside—W. M. Skinner, Drumin, Ballindalloch.
Stewarton—
Stirlingshire — J. M. Cunningham, Stirling.
Stirlingshire, Eastern District of—T. Binnie, Falkirk.
Stranraer and Rhinns of Galloway—D. Guthrie, Stranraer.
Strontian — A. Kinnear, Strontian, Fort William.
Strathearn Central—Robert Gardner, Auchterarder.
Strathearn—James M'Laren, Crieff.
Strathspey—F. Macbean, Grantown.
Tarbolton—E. Todd, Tarbolton.
Turriff—W. Ingram, Sunnyhill, Turriff
United East Lothian—Richardson and Gemmell, Haddington.

Vale of Alford—
Warthill (Turnip)—A. Singer, Rothmaise, Insch.
Wester Ross—D. Ross, Dingwall.
Western District of Fife—J. M'Farlane, Dunfermline.
West Kilbride—G. Harvey, Gill.
West Linton—A. Alexander, West Linton, Penicuik.
Whitburn—A. B. Brown, Whitburn.
Windygates—L. Adamson, Leven.
Wishaw—James Johnston, Wishaw.

IRELAND.

1. THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.—Established 1841. Secretary—Seymour Mowbray, 42 Upper Sackville St., Dublin. This Society holds an Annual Meeting for the exhibition of Cattle, Horses, Sheep, Pigs, and Implements, in the four Provinces of Ireland in succession.

2. THE ROYAL DUBLIN SOCIETY.—President—The Lord Lieutenant. It holds an Annual Cattle Show in April, a Horse and Ram Show in August, and a Winter Show of Stock. Secretary—W. S. Steele. Superintendent of Agricultural Department—A. Corrigan.

Fermanagh—H. Richardson.
Kerry—Jonathan Walpole, Tralee.
Kildare—Rev. R. W. Bagot.
North East—G. G. Bingham, Belfast.
Queen's Co.– Beymour Mowbray.

Chambers of Agriculture,

IN ASSOCIATION WITH THE CENTRAL CHAMBER IN LONDON, WITH THE NAMES AND ADDRESSES OF THEIR SECRETARIES.

ENGLAND.

Central Chamber—J. Algernon Clark, Salisbury Square.
Banbury District– C. Simmons, Henley-on-Thames.
Brecknockshire—C. Mordy, Brecon.
Cambridge and Isle of Ely—S. Holben, 28 Market Place, Cambridge.
Cheshire—T. Rigby, Winsford, Ches.
Cheshire, N.—J. May, Macclesfield.
Cirencester—R. Ellett, Cirencester.
Cornwall County — H. Tresawna, Lamellyn, Probus.
Devon and Cornwall—J. Moon, Plymouth.
Devonshire—B. J. Ford, Exeter.
  Branches.—Colyton & S. E. Devon, H. H Rogers, Colyton, Devon.
Devon, County of—Rev. R. W. Row, Newton Abbot.
Dorsetshire — H. Lock, Dorchester, and R. Genge, Waterson, Dorset.
Durham, S., & N. York.—C. Waistell, Darlington.
Essex—E. H. Bentall, Halstead.
Gloucestershire — A. C. Wheeler, Gloucester.
Gloucestershire, West—C. Wintle, 23 Clare Street, Bristol.
Goole and Marshland—Capt. R. S. Best, Goole.
Hampshire—H. Downs, Basingstoke.
Herefordshire—T. Duckham, 50 Broad Street, Hereford.
Hertfordshire—J. Bettinson, Hertford.
Howdenshire—H. Green, Howden.
Hungerford—W. Chandler, Hungerford, Wilts.
Kent, E.—G. Slater, Canterbury.
Kent, W.—S. G. Reader, Stone St., Maidstone.
Leicestershire — T. Wilson, Biggin Grange, Oundle.
Lincolnshire– S. Upton, St Benedict's Square. Lincoln.
  Branches.—Boston. G. W. Thomas, Boston; Brigg, F. C. Hett, Brigg; Grantham, J. B. Boyal, Grantham; Louth, J. W. Wilson.
Malton—J. Soulby, Malton, Yorkshire
Monmouth — R. Stratton, Duffryn, Newport, and J. S. Stone, Dock Street, Newport.
Newbury—G. J. Cosburn, Newbury.
Norfolk—C. R. Gilman, St. Giles St., Norwich.
  Branch.—West Norfolk, D. Ward, King's Lynn.
North of England—G. Armstrong, 3 Arcade, Newcastle.
  Branches.—Alnwick Union; Belford Union; Bellingham Union, E. Coulson, Bridgeford, Bellingham; Berwick Union; Castle Ward Union; Chester-le-Street Union; Gateshead Union; Glendale Union; Haltwhistle Union, C. Marshall, Riding-Mill; Hexham Union, C. Marshall, Riding-Mill-on-Tyne; Lanchester Union; Morpeth Union; Newcastle Union; Rothbury Union; Tynemouth Union.
Northamptonshire — T. J. Adkins, Northampton.
Nottinghamshire—E. Browne, Cranmer Quadrangle, Notts.
Peterborough—F. G. Buckle, Savings' Bank, Peterboro.
Ripon—G. M. Lomas, Lingham Lane, Thirsk.
Shropshire — W. Edwards, Shrewsbury.
  Branches.—Ellesmere, C. Thomas, Newnes, Ellesmere; Ludlow, W. Blakeway, Onibury, Salop; Market Drayton, T. L. Lightfoot, Market Drayton; Much Wenlock, E. H. Davies, Much Wenlock, Salop; Newport, R. W. Ralph, Newport, Salop; Oswestry, J. Richards, Lynclys, Oswestry; Shifnal, T. Nock, Sutton Maddock, Shifnal; Wellington, T. W. Davies, Sugdon, Wellington; Wem.
Somersetshire—H. G. Andrews, Sherborne, Dorset.
Staffordshire—W. Tomkinson, Newcastle, Staffordshire.
  Branches.—Burton-on-Trent and Tamworth; Lichfield; Newcastle; Uttoxeter; Wolverhampton.
Surrey—J. L. Hewitt, Putterham, Guildford.
Suffolk, East—R. L. Everett, Rushmere, Ipswich.
Suffolk, West—G. Blencowe, Bury St. Edmunds.
Sunderland—R. Thompson, Sunderland.
Swindon — J. H. Piper, Swindon, Wilts.
United Counties (Carmarthen, Pembroke, and Cardigan)—D. Prosser, White House, Carmarthen.
Warwickshire — H. Suffolk, 1 High Street, Coventry.
  Branches — Henley-in-Arden, J. Hannett, Henley-in-Arden; Shipston-on-Stour, S. H. Walton, Shipston-on-Stour.
Wisbech District—G. J. Moore, The Limes, Wisbech.
Worcestershire District—John Blick, Droitwich.
Worcestershire, East—J. L. Bozward, Worcester.
York—J. Grayston, York.
Yorkshire, E. Riding — T. Turner, Beverley.
  Branch. — Bridlington, C. Grey, Bridlington.
Yorkshire, W. Riding—M. B. Hick, Wakefield.
Yorkshire, N. Riding — J. Soulby, Malton.
  Branches. — Pickering, S. Baker, Wilton, Pickering; Ryedale, W. Hebron, Kirby-Moorside; Scarborough, G. Leighton, Moor House, Seamer; Whitby, J. Wilkinson, Whitby.

SCOTLAND.

Scottish Cent. Chamber—D. Curror, S.S.C., Edinburgh.

⁂ *See also under "Farmers' Clubs," for Societies and Clubs in association with the Central Chamber.*

Farmers' Clubs.

* Marked thus are associated with the CENTRAL CHAMBER OF AGRICULTURE in London.

ENGLAND.

Abergavenny—P. Morgan.
Abingdon—W. H. Davis.
Badminton—R. W. Lloyd.
Bakewell—W. Smith, Bakewell.
*Barnstaple —C. E. Northcote.
Berkeley—C. Tange.
*Bideford—E. Partridge, Monkleigh.
Blandford—S. Domoney.
Boroughbridge—G. T. G. Clarke.
Botley—W. C. Spooner, Southampton
Central—S. B. L. Druce, Adelphi Terrace, London.
*Cowbridge—G. E. Tutton, Cowbridge, Glamorgan.
Cirencester—
*Croydon—Streeter & Fuller, solicitors
Dorchester—G. J. Andrews.
Driffield—J. Kirkby.
East Derby—C. Courier, West Hallam
Easton—G. Osborne.
Eye—R. Costerton, Eye.
Farmers' Club (London)—S. B. L. Druce, Inns of Court Hotel, W.C.
Farringdon—E. W. Moore.
Framlingham—W. B. Kent.
Halesworth—C. Lenny, Wisset Grove.
Halstead—
Hexham—W. B Cooke, Hexham.
Hungerford—G. Collett.
Kendal—W. H. Wakefield.
Kingscote (Gloucester)—F. Burnett.
*Knoyle—J. Marsh, jun., Devizes.
Lincoln—J. G. Williams.
Lyonshall—W. Ball, Hope Farm.
Madley—G. Pye, Cutlington.
Maidstone—J. Brine.
Maristow—W. Moon, Maristow.
Melplaish—N. W. Loggan.
Midhurst—R. Death, Petworth.
Midland—J. B. Lythall, Birmingham.
Milborne—R. Fookes, Blandford.
Monmouth—H. Dyke, Monmouth.
Newcastle—E. J. Prowell.
North Wenlock—R. Davies, Little Werbeck.
Norton and East Derbyshire Agri. Society—J. N. Jephson, Chesterfield.
Over—T. Rigby.
Oxford—J. Plowman.
*Penrith—T. Robinson, Clifton.
Probus—H. Tresawna.
Reading—J. Pike.
Richmondshire—H. J. Turner.
*Lancashire—T. Rigby, Winsford.
Staindrop—R. Graham, Staindrop.
St Austell—W. Roberts.
Tarporley—W. Vernon.
Usk—G. B. Belph, Usk.
Vale of Avon and Stour—C. Reeks.
Wadebridge—R. G. Pollard.
Wakefield—W. Barratt, Wakefield.
Wenlock—R. Davis.
Weobley—T. C. Bull.
West Herefordshire—J. Mathews.
Winfrith—J. Reader.
Wirrall—W. Henderson, Birkenhead.

SCOTLAND.

Annandale —T. Annan.
Ayrshire—J. Cunningham, Shields.
Cammethen—
Central Banffshire—J. G. Brown, Keith.
Donside—W. Wishart, Blackburn.
Dundonald—J. Caldwell, Dundonald.
Easter Ross—J. Douglas, Calrossie.
Fettercairn — J. Smith, Balmain, Fettercairn.
Forres and Northern—R. H. Harris, Forres.
Gargunnock—T, Leishman, Meiklewood.
Garioch—W. Home, Pitmedden.
Haddington—Richardson and Gemmell.
Hamilton—
Kincardineshire—J. B. Greig, Laurencekirk.
Kelso—Robert Swan.
Lockerbie—W. Laidlaw, Hillside.
Logie and Lecropt—George Christie.
Lunan and Vinney—J. Morgan, Ethie, Chance Inn.
Morayshire — J. Ferguson and W. Macdonald.
North and West of Sutherland—W. Mitchell, Pulrossie, Dornoch.
Peebles—
Stranraer—A. H. M'Clean, Auchnea.
Strathbogie—W. Murdoch, Huntly.
Sutherland—
Wigtown—T. M'Mechan, Wigtown.
Ythanside—A. Cowie, Cromlybank.

Useful Tables and Memoranda.

WEIGHTS AND MEASURES.

MEASURES OF LENGTH.

12 inches .... = 1 foot.
3 feet .... = 1 yard.
5½ yards .... = 1 pole or perch.
40 poles .... = 1 furlong.
8 furlongs .... = 1 mile.

Note.—In measures of length another denomination, not given in the above table, is the "*hand*," used in measuring the height of horses. It is generally taken to be 4 inches in length. The *fathom*, used in mines or pit sinking, is 6 feet in length. The *league* is 3 miles. The *geographical mile* is in the proportion to the statute mile as 60 to 69.5. The *degree* is equal to 60 geographical miles or 69½ statute miles. The nautical mile is 6082.6 feet.

MEASURES OF LENGTH (GUNTER'S CHAIN) USED IN LAND SURVEYING.

7.92, or nearly 8 inches ...... = 1 link.
25 links, or 198 inches ...... = 1 pole.
4 poles .... = 1 chain.
10 chains, or 7920 inches ... = 1 furlong.
8 furlongs, or 63,360 inches = 1 mile.

Note.—In provincial measurements a pole or perch, in "Cheshire," is equal to 8 yards imperial; in what is called "plantation measure" it is equal to 7, and in "woodland" 6 yards. In various parts of England the "statute pole" is used. This is 5½ yards in length. These poles are used to measure off the lengths executed in draining, hedging, and the like. The measure of length used in Scotland for these purposes is known as the "fall of 6 ells."

A chain is equal to 100 links, or 702 inches, or 22 yards, or 66 feet. In Scotland it is equal to 24.706 yards, and in Ireland it is equal to 28 yards.

MEASURES OF SURFACES, OR SQUARE MEASURES.

144 square inches...... = 1 square foot.
9 square feet.......... = 1 square yard.
30¼ square yards ... = 1 square pole or rod.
40 square poles ...... = 1 rood.
4 roods .... = 1 acre.

Note.—An error is often made, which should be guarded against, in supposing the terms "square inches" and "inches square" to be synonymous, denoting, in fact, the same thing; but there is a great difference between them—"twelve square inches" is only the twelfth part of a square foot, but "twelve inches square" is 144 square inches.

Taking the imperial British standard acre of 4840 yards as the "unity," we find of the customary or provincial acres the following to be the proportions:—the *Scotch acre* is 1.2611; the *Cheshire acre*, 2.115; the *Lancashire acre*, 1.6252; the *Northumberland acre*, 1.2245; the *Devon acre*, .8273; the *Irish* or *Plantation acre*, 1.6198; the *Welsh acre*, 2 acres imperial.

In measuring an acre by yards, the usual practice is to trace off 70 yards in length and 70 yards in width. This, in a rough way, may be considered near enough for practical purposes, but as 70 yards either way makes 4900 square yards, it exceeds 1 acre by 60 yards. To determine an accurate acre, it may be measured 70 yards in length by 69 1-7th yards in width. The same result may be arrived at by measuring 220 feet in length and 198 feet in width, or by measuring 73¼ in length by 66 yards in breadth.

LAND SQUARE (OR GUNTER'S CHAIN) MEASURE.

62.726 square inches...... = 1 square link.
2.295 square links ...... = 1 square foot.
20.661 " ...... = 1 square yard.
625 " ...... = 1 square pole.
10,000 " ...... = 1 square chain.
2.5 square chains ...... = 1 square rood.
10 square chains .... = 1 square acre.
640 square acres .... = 1 square mile.

Note.—In Scotch measurement the "square fall" is very nearly 346 square feet imperial; 2½ chains square (see table No. 2), or 40 falls, equal to 1 square rood; 4 square roods make 1 square acre, which is equal to 6150½ square yards imperial.

CUBIC MEASURES OF SOLID BODIES.

1728 cubic inches .... = 1 cubic foot.
46,656 " or 27 cubic ft. = 1 solid yard.
40 solid ft. of rough, or 50 solid ft. of hewn timber = 1 load.
42 solid feet........... = 1 ton of shipping.

Note.—While *square* measure is based upon the square of numbers, which is found by multiplying any number into itself as 4 × 4 = 16, which is the square of 4, *Cubic* measure is based by multiplying any number twice into itself, as 4 × 4 × 4 = 64, which is the cube of 4. *Surface* has only length and breadth; a *solid* body has length, breadth, *and* thickness.

DRY MEASURES, OR MEASURES OF CAPACITY.

4 gills .... = 1 pint.
2 pints.................. = 1 quart.
4 quarts .... = 1 gallon.
2 gallons................ = 1 peck.
4 pecks .... = 1 bushel.
8 bushels............... = 1 quarter.

Note.—14 pounds of flour form 1 peck, and is called a stone.

AVOIRDUPOIS WEIGHT.

27.433 grains............... = 1 dram.
16 drams .... = 1 ounce.
16 ounces .... = 1 pound.
28 pounds .... = 1 quarter.
4 quarters or 112 pounds = 1 hundredweight.
20 hundredweight......... = 1 ton.
14 lb. = 1 stone; 8 stones or 112 lb. = 1 cwt.

HAY AND STRAW.

36 pounds............ = 1 truss of straw.
60 pounds............ = 1 „ new hay.
56 pounds............ = 1 „ old hay.
36 trusses .... = 1 load.

Weighing for old hay 18 cwt., for new hay 19 cwt. 32 lbs., and for straw 11 cwt. 64 lbs.

FRENCH MEASURES, MONEY, &c.

LINEAR MEASURE.

French.	*Metre.*		*English.*
Millimetre	.001	=	.03937 inches
Centimetre	.01	=	.39371 „
Decimetre	.1	=	3.93710 „
Metre	1	=	39.371 „
Decametre	10	=	393.71 „
Hectometre	100	=	3937.1 „
Kilometre	1000	=	39371. „
Myriametre	10,000	=	393,710 „

Note.—The basis or unit of the system is the *metre*, the length of which in English measure is 1.0936 yards, or 3.2809 feet, or as above in inches. By *multiplying* the metre respectively by 10, 100, 1000, and 10,000, we obtain the *deca*, *hecto*, *kilo*, and *myria* metre respectively; and by *dividing* the metre by 10, 100, and 1000, we obtain the *deci*, *centi*, and *milli* metre respectively.

SUPERFICIAL MEASURE.

French.		*English.*
Milliare	=	155 square inches
Centiare	=	10.764 square feet.
Deciare	=	11.96 square yards.
Are, 1 square decametre, or		119.6 „
Decare	=	1196 „
Hectare	=	2.472 square acres

SOLID MEASURE.

French.		*English.*
Millistere	=	01.028 cubic inches.
Centiare	=	610.28 „
Decistere	=	3.53170 cubic feet.
Stere, to 1 cubic metre, or		35.317 „
Decastere	=	13.08 cubic yards.
Hectastere	=	130.8 „
Kilostere	=	1308 „

MEASURES OF WEIGHT.

French.		*English.*
Milligramme	=	.015434 grains troy.
Centigramme	=	.15434 „
Decigramme	=	1.5434 „
Gramme	=	15.434 „
Decagramme	=	.32154 ounces troy.
Hectogramme	=	3.527 ounces avoir.
Kilogramme	=	2.2048 lb. avoir.
Myriagramme	=	22.048 „

Note.—The *gramme* unit of weight in the metrical system is equal to a cubic centimetre of distilled water in vacuo at its maximum density, or 39° Fah.

MEASURES OF CAPACITY.

French.		*English.*
Millilitre	=	.001028 cubic inches.
Centilitre	=	.061028 „
Decilitre	=	6.10280 „
Litre	=	1.761 imp. pints.
Decalitre	=	2.2 imp. gall.
Hectolitre	=	2.75 imp. bush.
Kilolitre	=	35.317 cubic feet.
Myrialitre	=	353.17 „

COINAGE.

Gold	1 Napoleon	= 20 francs
„	½ „	= 10 „
Silver	5-franc piece	= 5 „
„	2 „	= 2 „
„	1 „	= 1 „
„	½ „	= 50 centimes
„	1-5 „	= 20 „
Copper	A two-sous piece	= 10 „
„	One sous	= 5 „
„	A centime	= 1 „

Note.—100 centimes make one franc, equivalent in English money to nearly 10d. A sovereign is, in the average of exchange, equal to 25 francs 25 centimes; in ordinary transactions, 25 francs. A penny is nearly equal to ten centimes; thus, by taking off the last figure of any number of centimes, we have the English equivalent in pence, thus—50 centimes, 5 pence; 70 centimes, 7 pence; 75 centimes, 7½ pence; and so on.

A centime may be used at once as a measure and a weight; as a "measure," inasmuch as its diameter is exactly a centimetre; 100 of them, therefore, placed in a right line, will make exactly a metre. It may be used as a weight, as it weighs exactly a gramme; 100 of them will thus form a hectogramme.

THERMOMETRIC SCALES.

	Fahrenheit. Deg.	*Centigrade.* Deg.	*Reaumur.* Deg.
Boiling point	212	100	80
	200	93.3	74.6
	180	82.2	65.7
	160	71.1	56.8
	140	60.0	48.0
	120	48.8	39.1
	110	43.3	34.6
	100	37.7	30.2
	90	32.2	25.7
	80	26.6	21.3
	70	21.1	16.8
	60	15.5	12.4
	50	10.0	8.0
	40	4.4	3.5
Freezing point	32	—	—

COMPARISON OF ENGLISH AND FRENCH WEIGHTS AND MEASURES.

1 inch	=	2.539 centimetres.
1 foot	=	3.0479 decimetres.
1 yard	=	0.9148 metres.
1 mile	=	1609.31 „
1 square inch	=	6.444 sqr. centimetres.
1 square foot	=	9.2903 sqr. decimetres.
1 square yard	=	0.83097 square metres.
1 cubic inch	=	16.3052 cubic centimetres.
1 cubic foot	=	28.314 cubic decimetres.
1 cubic yard	=	764.58 „
1 pint (imperial)	=	.55 „
1 gallon „	=	4.404 „
1 bushel „	=	35.238 cubic decimetres.
1 ounce (avoirdupois)	=	28.338 grammes.
1 pound „	=	453 „
1 hundredweight „	=	50.796 kilogrammes.
1 ton „	=	1015.938 „

Note.—To change *French grammes* into *pounds* (avoir.) *English*, we have only to multiply the number of grammes by .0022. To change *kilogrammes* into *cwts.*, we have to multiply by 0.1969. To change *lbs. English* into *kilogrammes French*, multiply by 0.4535. To change *gallons* into *litres*, multiply by 4.543. To change *cubic inches* into *litres*, multiply by .0163.

COVENT GARDEN WEIGHTS AND MEASURES.

A bundle of asparagus contains from 100 to 150 heads.

A bundle of celery and broccoli, according to size, from 6 to 20 heads.

A bundle of rhubarb, from 20 to 30 stems, according to size and season.

A bunch of carrots, from 36 to 40.

A bunch of turnips, from 20 to 25.

A bunch of greens, as many as can be tied together by the roots.

A bunch of herbs, varies much according to the kind and season.

A pottle of mushrooms is expected to hold as many as will weigh 1 lb. They do not always do so. Properly a pottle should contain 138.437 cubic inches.

A pottle of strawberries is supposed to hold ½ gallon, but seldom does hold more than 1½ pint.

Punnets are of various sizes, but are not recognised as an imperial measure, and are chiefly confined to the London markets. Sea-kale punnets are baskets made of split laths, 2 to 6 inches deep, and from 5 to 9 inches in diameter — the largest size containing from 12 to 18 heads. The medium size is 8 inches in diameter at the top, and 7½ inches at the bottom, and 2 inches deep.

Radish punnets, 8 inches in diameter and 1 inch deep, if to hold six hands; or 9 inches by 1 inch for twelve hands.

Mushroom punnets, 17 inches by 1 inch.

Salading punnets, 5 inches by 2 inches.

A hand of radishes should be from 12 to 30 in number, according to the season.

A score of lettuce is 22 heads.

A sieve of peas is equal to 1 bushel, contains 10½ imperial gallons, and is 17¾ inches in diameter at top, and 11¼ inches deep.

A sieve of currants, about 20 quarts; half-sieve, about 10 or 11 quarts

A sieve or basket of cherries, 48 lb.

A sieve *proper* contains 7 imperial gallons, and is 15 inches in diameter, and 8 inches deep. A half-sieve *proper* contains 3½ imperial gallons. It averages 12½ inches in diameter, and 6 inches in depth.

Grapes are put up in 2-lb. and 4-lb. baskets.

Peaches, nectarines, and apricots into ½ dozen or dozen baskets.

New potatoes are generally put up into 2-lb. punnet baskets.

Apples and pears are put up in bushels, sieves, half-sieves; the sieve being equal to a bushel. In Scotland, they are sold by the lb., gallon, or sleck, which latter represents a peck or 2½ gallons.

A hundredweight of Kentish filberts is 104 lb.

Old potatoes are sold by the bushel, sack, or ton.

A bushel measure should be 19½ inches in diameter, ½ bushel, 15½ inches; a peck, 12¼ inches; and, in lon, 9¾ inches; and ½ gallon, 7¾ inches; and, in all cases, the outside diameters of these measures should be at least double the depth.

An imperial gallon contains 10 lb. avoirdupois of pure or distilled water, 1 pint, 1¼ lb.; and 1 bushel, 80 lb. Fruit and potatoes are usually sold by the heaped measure—1 peck containing 704 cubic inches nearly; 1 bushel, 2815½ cubic inches; and 1 sack, 4 8-9 cubic feet nearly, or about 3½ bushels.

A bushel basket ought, when heaped, to contain an imperial bushel, and be 14½ inches in diameter at top, 10 inches at bottom, and 18 inches deep. Walnuts, nuts, apples, pears, and potatoes are sold by this measure. A bushel of the latter, when cleaned, weighs 56 lb., and 4 lb. additional are allowed when they are not washed.

In reference to these measures, we take the following from the *Villa Gardener*, vol. i., page 424:—

Punnets (fig. 1) are made of thin split laths, and are of various sizes, from 3 to 6 inches deep, and from 6 to 9 inches in diameter, according to the sort of vegetable or fruit to be placed in them, and with or without handles, to suit specific purposes. In such baskets all the most choice vegetables are carried to Covent Garden market, such as forced Potatoes, Kidney Beans, Brussels Sprouts, Mushrooms, &c. Punnets are so very inexpensive that no villa garden should be without a stock of them. The following are the special sizes known to the London market gardeners:—

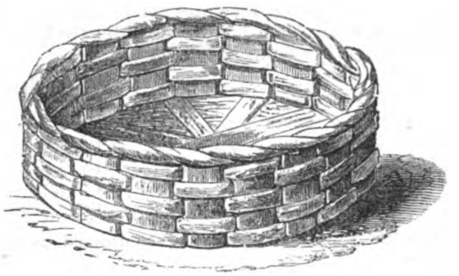

Fig. 1.—Salad Punnet.

Strawberry Pottle.—A long tapering cone, holding about 1½ pint.

Seakale Punnets.—8 inches in diameter at top, 7½ at bottom, and 2 inches deep.

Radish Punnets.—These are made 8 and 9 inches in diameter, and 1 inch deep; the former to hold 6 hands, and the latter 12 hands.

Mushroom Punnets.—7 inches in diameter and 1 inch deep.

Salad Punnets.—5 inches in diameter and 1 inch deep.

Fruit and vegetables are brought to Covent Garden market, and disposed of to the retail dealers, in Osier baskets called Sieves, Half-Sieves, Bushel-Sieves, and Bushel Baskets. The following are the sizes:—

Sieve.—15 inches in diameter and 8 inches deep. Contains 7 imperial gallons.

Half Sieve.— 12½ inches in diameter, and 6 inches deep. Contains 3½ gallons.

Quarter Sieve.—Contains 1¾ gallons.

Bushel Sieve.—17¾ inches in diameter at top, and 17 inches at bottom; depth, 1¼ inches. Contains 10½ gallons.

Bushel Basket.—14½ inches in diameter at top, and 10 inches at bottom; depth, 17 inches. Walnuts, Nuts, Apples, and Potatoes arc sold by this measure. When heaped (although contrary to the statute), this measure contains an imperial bushel.

In the *Mechanics' Magazine* of May 18, 1833, Mr Bevan, of Leighton, gives the following particulars as to the capacity of these measures; and for those of our readers who study exactness, the information may be useful:—"To obtain the required information for myself and others, I purchased a new set of these measures off one of the principal vendors in Covent

Garden market, and have ascertained their capacities, heaped measure, to be as follow :—

	Cubic inches.		
The Sieve contained	1644	or about	½ bushel
Half Sieve	822	,,	1 peck
Quarter Sieve	362	,,	1 gallon
Largest Punnet	284	,,	7 pints
Second Punnet	228	,,	1 pottle
Third Pottle	98	,,	1 quart
Least Punnet	60	,,	1½ pint

But as, in practice, they may not be filled to the maximum, it may be inferred that, relatively to a bushel, the proportion will stand as follows :—

2 Sieves .... = 1 bushel
4 Half Sieves .... = 1 ,,
8 Quarter Sieves .... = 1 ,,
12 Large Punnets .... = 1 ,,
16 Second Punnets .... = 1 ,,
32 Third Punnets .... = 1 ,,
48 Least Punnets .... = 1 ,,

In other words, they may be considered as follows :—

One Sieve .... = ½ bushel
Half Sieve .... = 1 peck
Quarter Sieve .... = 1 gallon
Large Punnet .... = 5⅓ pints
Second Punnet .... = 1 pottle
Third Punnet .... = 1 quart
Least Punnet .... = 1½ pint

SIZES OF FLOWER POTS.

	Width.		Depth.	
Thimbles	1	inches	2	inches
Thumbs (called 80's)	1½	,,	2	,,
Sixties (60's)	2	,,	2½	,,
Forty-eights (48's)	3	,,	4	,,
Thirty-twos (32's)	4	,,	5	,,
Twenty-fours (24's)	5	,,	6	,,
Sixteens (16's)	6	,,	7	,,
Twelves (12's)	7	,,	6	,,
Eights (8's)	8	,,	7	,,
Sixes (6's)	9	,,	8	,,
Fours (4's)	12	,,	10	,,
Twos (2's)	18	,,	12	,,

There are also large and small 60's, large and small 32's, being intermediate in size between each larger and smaller size.

The width given is the inside diameter at top. At different potteries different practices prevail, but the above names and sizes are now adopted almost universally.

TO ESTIMATE THE CONTENTS OF DUNG-HEAPS.

Multiply the mean area by the mean depth, the quotient will be solid contents in cubic yards.

Note.—The mean area of a heap is found by adding to the area of the base half the area of the top. The mean depth is the average of various depths; this being found by dividing the sum of the several depths by the number.

To find the contents of various forms of dung-heaps.—Where the form is that as shewn in the diagram—fig. 2 being the end, and fig. 3 the side view—measure the height from *e* to *f*, and half of the base *a b*, which multiply by *e f*, and the quotient by the length *f g*.

Where the form is that shewn in the diagram, of which fig. 4 is the side, and fig. 5 the end view, multiply the length *j k* by the height *i k* and the breadth *l m*; the result will be the number of cubic yards in the heap.

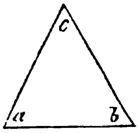

Fig. 2.

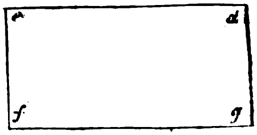

Fig. 3.

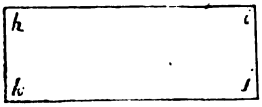

Fig. 4.

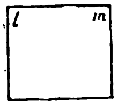

Fig 5.

Note.—A cubic yard weighs from 15 to 20 cwt. Fifteen to twenty tons may be lifted by a labourer into a cart per day.

TO CALCULATE THE CONTENTS OF CISTERNS.

To determine the contents of a cistern, circular in form and of equal size top and bottom, is the following :—Find the depth and diameter, and multiply the square by the decimal .0034, which will find the quantity in gallons for one inch in depth. Multiply this by the depth, and divide by 3½, and the result will be the number of barrels the cistern will hold. For each foot in depth the number of barrels answering to the different diameters are—

For			
For	5	feet diameter	4.66 barrels.
,,	6	,, ,,	6.71 ,,
,,	7	,, ,,	9.13 ,,
,,	8	,, ,,	11.93 ,,
,,	9	,, ,,	15.10 ,,
,,	10	,, ,,	18.65 ,,

By the rule above given the contents of barn yard cisterns and manure tanks may be easily calculated for any size whatever.

CISTERNS FOR RAIN WATER.

The size of cisterns should vary according to their intended use. If they are to furnish a daily supply of water, they need not be so large as for keeping supplies for summer only. The average depth of rain which falls in this latitude, although varying considerably with season and locality, rarely exceeds 7 inches for two months. The size of the cistern, therefore, we daily use need never exceed that of a body of water on the whole roof of the building 7 inches deep. To ascertain the amount of this, multiply the length by the breadth of the building, reduce this to inches, and divide the product by 231, and the quotient will be gallons for each inch of depth. Multiplying by 7 will give the full amount for two months' rain falling upon the roof; divide by 31½, the quotient will be barrels. This will be about fourteen barrels for every surface of roof 10 feet square, when measured horizontally; therefore, a cistern for a barn 30 by 40 feet should hold 168 barrels—that is, as large as one 10 feet in diameter and 9 feet deep. Such a cistern would supply, with only 30 inches of rain yearly, no less than 630 barrels, or nearly two a day. Cisterns intended only for drawing from in times of drought, to hold all the water that may fall, should be about three times the preceding capacity.

LIQUID MANURE TANKS.

A tank should not exceed 6 feet in depth. Its length being immaterial, so far as its construction is concerned, must depend on the size of the farm, or rather upon the number of cattle housed upon it. A convenient width is 6 feet, for this admits of an arch being carried over the tank at a moderate cost. As a rough guide to the size of tank required on a farm, an allowance of 1000 gallons for each cow should be made; and this number of gallons occupies 162 cubic feet. The bottom of the tank may be either laid with pavement or brick on edge, the level falling towards the centre, where a well-hole of about a foot in depth should be provided to receive the end of the suction-pipe. If the ground is of a soft, yielding, or treacherous character, it will be advisable to place below the bottom a layer of concrete (as *d d*, fig. 6), made of broken stones, bricks, or gravel—the last is the best—and lime, five parts of the former to one of latter—the layer of concrete being at least 12 inches thick. If the soil in which these cisterns are constructed be dry, the bricks may be set in ordinary mortar; but if wet, hydraulic lime should be used.

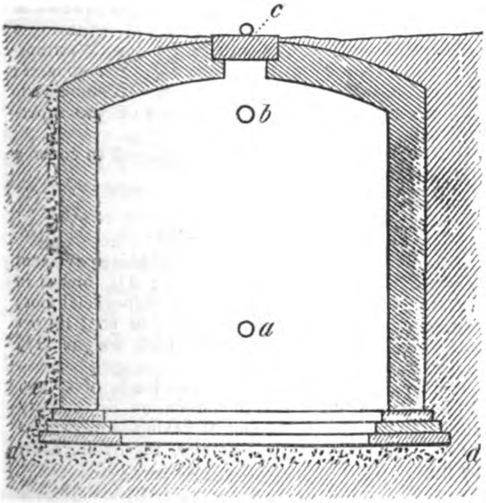

Fig. 6.

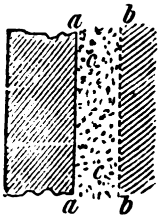

Fig. 7.

In all cases, if a perfect job is desired, the earth should not come close up to the wall (*a a*, fig. 7) of the tank, but a space should be left between this and the earth (*b b*), into which clay—or puddling as it is termed—should be hard rammed. In constructing tanks of this kind it is essential to have the brick-work carried regularly and uniformly up, no course exceed 2 feet in height.

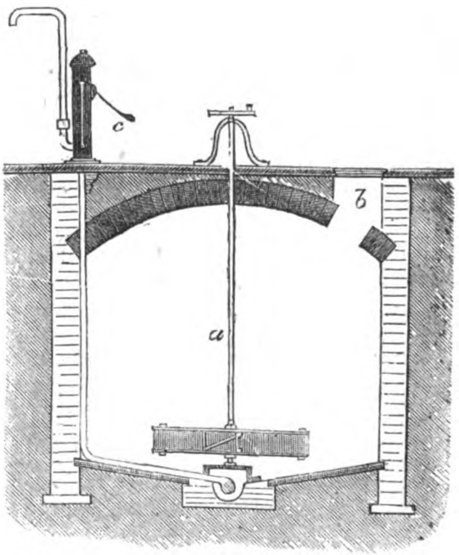

Fig. 8.

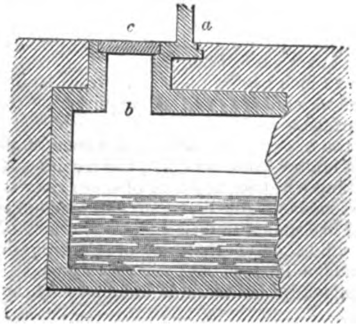

Fig. 9.

A very useful addition to all manure tanks is an "agitator," to be used to stir the liquid when water is added, so as to bring the contents to a uniform state when being drawn off. This agitator, which is shewn in fig. 8 (*a*), consists of an iron rod, with two or four arms or fans working in a socket fixed in the grating over the well-hole. The rod is brought through the cover of the tank about 3 feet, and terminates in two handles at right angles to the rod, by which the agitator is set in motion as required. Fig. 8 shews the section of a tank constructed in the manner thus described, *a* being the agitator; *b* man-hole; *c* pump, with movable hose or piping for filling the liquid manure cart. The Flemish mode of constructing manure tanks is thus described by Mr Stephens:—

"The tank is frequently constructed underneath the stable and cattle-house, the liquid being led to it by open gutters running along in front of the stalls. Part of it projects beyond the wall, as in fig. 9 at *a*, and is provided with a well-hole *b*, through which the liquid is taken when required for use by means of a pump, or long-handled ladle. The aperture is closed by a wooden or stone cover *c*, as shewn. Brick is used in its construction, and the bottom and sides are well cemented, to make the whole water-proof. Sometimes the tank is divided into various compartments, these being designed to hold the liquid manure collected at different periods.

Quantity of Liquid Manure contained in Tanks 10 *feet deep in different diameters*:—

Diameter of Tank.		Quantity in Gals.	Total Cost.		
Ft.	In.				
6	10	2.269	£8	6	2
9	8	4.538	12	4	0
11	10	6.807	15	17	4
13	8	9.076	19	7	0
15	3	11.345	22	5	4
16	8	13.614	25	3	6
18	0	15.883	27	17	0
19	4	18.152	30	16	3
20	5	20.421	33	15	0
21	7	22.690	36	3	0

BRICKS AND MORTAR.

Thirty-six common stocks, laid flat on sand, required to do 1 square yard of flooring.

Fifty-six common stocks, if laid on edge, required to do 1 square yard of flooring.

Thirty-two paving bricks, laid flat, required to do 1 square yard of flooring.

Eighty-four paving bricks, if set on edge, required to do 1 square yard of flooring.

Nine 12-inch paving tiles, and twelve 10-inch tiles, 144 Dutch clinkers, will be required to cover the same surface.

One ton of stone lime will build a rood of 36 square yards of hollow brick wall, 1½ ton a solid wall; each ton of lime will take 2½ tons of sharp river sand.

Two loads of chalk lime and four loads of sand are allowed in London to do 1 rod of 272 feet of brickwork, solid; or, 1 chaldron of Dorking lime and four loads of Thames sand will do the same.

In England, brickwork is calculated by the rod of 272 superficial feet; in Scotland, both brick and stone walls are measured by the rood of 36 superficial feet. In England, the standard thickness of all brick walls is a brick and a half, or, that is, the length of one brick and the breadth of another; the standard thickness of rubble walls in Scotland is 2 feet. Four thousand five hundred place bricks, or 4300 stock bricks, is the London allowance for a rod of brickwork, including breakage and waste. English place and stock bricks weigh on an average 2 tons 5 cwt. per 1000, or 5 lb. each, or, more correctly, 2 tons 4 cwt. 2 qr. 16 lb. In measuring the work, all walls must be reduced to standard thickness.

SLATES AND SLATING.

In England, slating is measured by the square of 100 superficial feet; in Scotland by the rood of 36 superficial yards.

One thousand English slates (1200 Ladies, measuring each 16 inches × 8 inches) weigh 1 ton 5 cwt., or 2 lb. 6 oz. each, and will cover 4¾ squares of roofing. Countesses, each 20 inches × 10 inches, weigh 3 lb. 12 oz. each, or 2 tons per 1000 of 1200, and will cover 7½ squares of roofing. Duchesses are 24 inches × 12 inches, weighing 5 lb. 10 oz. each, or 3 tons per 1000 of 1200, and will cover 10 squares of roofing. Doubles, 1000 will cover 2½ squares; 1 ton Imperials, 2¼ to 2½ squares; 1 ton Westmorland, 2 squares; 1 ton Rags, from 1¾ to 2 squares; 1 ton of Queens, 2¼ to 2½ squares. In some parts of Derbyshire they measure by the bay of 500 superficial feet.

One thousand Scotch slates are required to cover a rood; the 1000 is taken at 1200.

STONE MASONS' WORK.

One hundred superficial feet of Yorkshire pavement 2 inches thick weighs 1 ton 5 cwt.; 2½ inches in thickness, 1 ton 15 cwt., or 39 lb. per superficial foot, 3 inches thick, weighs 2 tons 5 cwt., or 50½ lb. per foot. Portland pavement 1 inch thick weighs 11½ lb. per superficial foot.

Thirty tons, or about thirty cart-loads of stones, will be required for a rood of foundation or ordinary rubble work. One cubic foot of paving-stone weighs 151 lb.; millstone, 155 lb.; granite, 165·87 lb.; slate, 167 lb.

Cropping the Farm Kitchen Garden.

HOW AND WHEN, AND QUANTITY OF SEED AND PLANTS REQUIRED.

Asparagus.—Sow about the middle of March, in beds 4 feet wide, and 15 inches row from row: to be transplanted next year (allowing it is to remain for two years in the seed-bed) into rows about the middle of March, at the distance of 2 feet, and 1 foot plant from plant in the rows. To sow a drill of 192 feet will require ½ lb. seed. For a bed 4 feet wide, with two rows in the bed, at 1 foot apart in the rows, and 21 feet 6 inches long, will require 41 plants.

Artichoke (Globe).—Plant from offsets about the 1st of March, in rows at the distance of 3 feet, and 2½ feet plant from plant in the rows. A bed 31 feet long by 7 feet will require 29 plants.

Artichoke (Jerusalem).—Plant from tubers the second week of March, in rows at the distance of 3 feet, and 14 inches plant from plant in the rows. A drill 19 feet 4 inches will take 17 sets.

Beans (Common).—*Early*—Sow the 1st of March, in rows at the distance of 2 feet, and 3 inches Bean from Bean in the rows. To sow a drill of 70 feet will require ½ lb. of seed. *Late*—Sow in April and May, in rows 2 feet 6 inches apart, and 4 inches Bean from Bean in the rows. To sow a drill 66 feet long will require ½ lb. of seed.

Beans (Kidney).—Sow about the second week in April, to June, in drills 20 inches distant, and 3 inches apart in the rows. ¼ lb. seed will plant 30 yards in length.

Beans (Scarlet Runners).—Sow about the end of April, in drills, at the distance of 4 feet, and 4 inches apart Bean from Bean in the rows. ½ lb. will plant a drill 66 feet long.

Broccoli.—Sow from seed; the seed-bed may be 4 feet by 3 feet; sow middle of March, the first, the middle, and end of May. Plant out when ready, in rows at the distance of 2½ feet, and 2 feet apart in the rows. ¼ oz. will sow a bed 4 feet by 3 feet.

Beetroot.—Sow about the end of April, in drills, at the distance of 14 inches, and, when from 4 to 5 inches high, thin out to the distance of 5 inches. ½ oz. will sow a drill of 25 feet in length.

Brussels Sprouts.—Sow from seed as directed for Broccoli; sow about the end of March, and plant out when ready into rows at the distance of 18 inches, and 18 inches apart in the rows. ¼ oz. will sow a bed 5 feet by 3 feet.

Borecole or Greens.—Sow from seed, as the last; sow the middle of March, and plant out about the end of May, in rows 2 feet each way; another sowing may take place in August, to be afterwards transplanted out in March. ¼ oz. will sow a bed 5 feet by 3 feet.

Cauliflower.—Sow from seed the middle of August, the middle of February, the end of March, and the last sowing about the end of May, and plant out when ready into rows at the distance of 2 feet, and 2 feet apart in the rows. ¼ oz. of seed will sow a bed 4 feet by 3 feet.

Cabbage.—For the early crop, sow the first week of August, successional crops about the end of March and the last week of May, to be afterwards transplanted into rows at the distance of 2 feet, and 18 inches apart in the rows. *Red Cabbage*—Transplant in March at the distance of 2 feet each way. ¼ oz. of seed will sow a bed 5 feet by 3 feet.

Carrots.—Sow from seed, from February to July, in shallow drills, at the distance of 12 inches drill from drill. When arrived at the height of 5 inches, have them thinned out to the distance of 3 inches, and afterwards to 6 inches: from 3 to 4 inches will be sufficient for Early Carrots. Principal crop, sow the first week in April. 1 oz. of seed will sow 15 square yards, or 50 yards in length.

Celery.—Sow from seed, in a hot-bed frame, the 1st of March at a temperature of 60 deg. When about 2 inches high, transplant to another bed where there is a temperature of 60 deg. Harden off gradually before removing, and when they have arrived at from 6 to 8 inches, have them planted out into trenches prepared for their reception. Plant 10 inches apart in the rows. 2 drachms of seed will be sufficient for a bed 5 feet by 3 feet.

Chives.—Plant from parting roots the 1st of March into 4 feet wide beds, at the distance of 8 inches drill from drill, and six bulbs in each patch, at the distance of 6 inches apart in the rows.

Cress.—Sow from seed from March to September. Sow once a-week during summer, in shallow drills, at the distance of 9 inches, and sow thick. ½ oz. of seed will sow a drill 18 feet long.

Endive.—Sow from seed the first week of July, in a small bed of rich earth; and in five or six weeks transplant into small trenches at the distance of 15 inches, and the plants 10 inches apart in the rows. 2 drachms will sow a bed of 10 square feet.

Leeks.—Sow from seed, the middle of March, in rich ground, in drills 12 inches distant; to be afterwards transplanted out in July in drills 15 inches distant, and 9 inches apart in the rows. ½ oz. of seed will sow a drill of 64 feet.

Lettuce.—Sow from seed, the middle of August, in small bed; to be afterwards transplanted into a frame in October, 6 inches apart. Sow every month where the demand is great from February to August; and when from 3 to 4 inches high, plant out into rich earth 12 inches distant, and 9 inches apart in the rows. ½ oz. of seed will sow a bed of 4 square yards.

Onions.—Sow from seed, the 1st of March, in beds 4½ feet wide, or in shallow drills, at the distance of 12 inches row from row, and 1 inch deep. The latter system we prefer, being more easily cleaned than on the bed system. Another sowing may take place the first week of August for the spring 4 to 5 inches high, should be thinned out to 3 inches, and afterwards to 6 inches. 1 oz. of seed will sow a drill of 100 feet.

Parsley.—Sow from seed, the 1st of March, in drills 12 inches apart, and ¾ inch deep. 1 oz. of seed will sow a drill of 29 yards.

Parsnips.—Sow from seed, the 1st of March, in drills at the distance of 18 inches, and 1 inch deep. When the plants are up, and from 4 to 5 inches high, have them thinned out to 4 inches, and afterwards to 8 inches. ½ oz. of seed will sow a bed of 12 square yards; ½ oz. will sow a drill of 80 feet.

Peas.—Sow from seed once every three or four weeks from February to the end of June (early crop) in drills 4 feet distant: for late tall-growing varieties, sow in drills from 5 to 6 feet distant, and crop with Spinach between the rows. 1 lb. of seed will sow a drill of 40 feet.

Potatoes.—Plant from tubers or sets, the middle of March, in drills 2½ feet distant, and 1 foot apart in the rows, and 3 inches deep. ½ stone, when cut into sets, will plant a drill of 139 feet, at 1 foot apart in the rows; or the same weight of Kidney Potatoes, when planted whole, will plant a drill of 48 feet, at 1 foot apart in the row.

Rhubarb.—Plant from roots, the middle of March, in rows at the distance of 3 feet apart in the rows.

Radish (Horse).—Plant from crowns with 2 inches of the roots attached, the middle of March, in drills 2 feet distant, and 8 inches plant from plant in the rows.

Radish (Common).—Sow from seed, once every two or three weeks from March to the end of August, in shallow drills, at the distance of 9 inches; and when from 3 to 4 inches high, have them thinned out to 3 inches. 1 oz. of Salmon or Turnip seed will sow a bed of 24 feet square.

Skirret.—Sow from seed, the end of April, in shallow drills, at the distance of 12 inches row from row, and 1 inch deep; and when from 4 to 5 inches high, have them thinned out to 8 inches. ½ oz. of seed will sow a drill of 14 feet.

Savoys.—Sow from seed, in a small bed, the same as for Broccoli, the middle of March, and plant out the latter end of May, in drills 2 feet distant, and 18 inches apart in the rows. Another sowing may be made the first week of August, to be transplanted out in March. ¼ oz. of seed will sow a bed 5 feet by 3 feet.

Seakale.—Sow from seed, the first week of April, in beds 4 feet wide, and two rows in each bed, at the distance of 2 feet. When the plants are up, and a few rough leaves upon them, have them thinned out to the distance of 12 inches, providing they are to remain in the beds. Thin out afterwards to 2 feet. 1 oz. of seed will sow a drill of 18 feet.

Spinach.—Sow from seed, from February to July, between the rows of Peas. Another sowing may be made the first week of August, in drills 14 inches distant row from row. When the plants are up, and by the middle of September, have them thinned out to 6 inches. ½ oz. of seed will sow a drill of 100 feet.

Turnips.—Sow from seed, once every two or three weeks from the middle of March until the end of July, in shallow drill, at the distance of 18 inches row from row, and 1½ inch deep. After the plants are up, and a few of their rough leaves 1 inch broad, have them thinned out to the distance of 4 inches and afterwards to 8 inches. ½ oz. of seed will sow a drill of 50 feet.

NOTE. —*The figures refer to the weeks in each month ; in early situations sow the early, and in late, the latter part of each respective week.*

Sow.	SEED-TIME.									
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Nov.
Asparagus	...	...	2							
Beans, Early Broad	2	2	...	...	...	2	2			
,, Windsor, &c.	...	2	2	2	2	2				
,, French Dwarf	...	...	..	3	2	2	1			
,, Scarlet Runner	...	...	...	3	2					
Beet	...	...	...	...	1					
Borecole and Kale	...	...	1	2						
Broccoli, Early (Snow's)	...	...	1 4	2	1					
,, Late	...	...	2	2						
Brussels Sprouts	...	...	2	2						
Cabbage, Early	...	...	1	2	...	...	2			
,, for Coleworts	...	...	...	1	3	2				
Cauliflower, Early	...	2	2	...	...	...	...	3	2	
,, Late	...	...	2	2	2	2				
Carrot, Early	...	3	2	2	2	...	...	2		
,, Late	...	...	...	1						
Celery	...	2	3							
Corn Salad	...	...	2	...	...	...	1			
Cress and Mustard	...	2	2	2	2	2	2	2	2	
Cucumber	...	...	...	4	2					
Gourd	...	...	...	3	2					
Kohl Rabi	...	...	...	3	2					
Leek	...	...	2	2						
Lettuce, Cos ,, Cabbage	...	...	2	2	1 3	1 3	1 3	2	1	
Onion	...	...	2	...	...	...	...	3	2	
Parsnips	...	...	1							
Parsley	...	...	1	1	2					
Peas, Early	2	2	...	...	...	...	2	...	...	2
,, Late	...	...	2	2	2	2	2			
Potatoes, Early	...	3	2							
,, Late	...	...	2							
Radish, Early Turnip	2	2	2	2	2	2	2	2	2	2
Rhubarb	...	...	...	1						
Savoy	...	...	2	2						
Seakale	...	...	...	1						
Spinach	...	2	2	2	2	2	2	1		
Turnips	...	2	2	2	2	2	2	2		
Vegetable Marrow	...	...	...	2	1					
Pot Herbs	...	...	2	2	2					

Sow everything in drills, whether in seed beds or as permanent crops. Small seeds, such as Onions, Carrots, &c., in addition, should be dibbled in the drills : half the usual quantity of seed will thus be sufficient. Avoid broadcast sowing altogether. It is not necessary to manure for every crop ; Carrots and Parsnips are better without it ; but Broccoli, Cauliflower, and all the Brassicas should be plentifully supplied with it, both solid and liquid. The first and last crops of tender varieties of vegetables, as Peas, Cauliflowers, French Beans, Lettuces, Radishes, should be sown in sheltered situations. To render the succession of vegetables certain, sow two or three varieties at the same time.

NUTRIMENT.

Of the comparative nutriment contained in various articles of food. The figures appended to each article shew the proportion of nutriment in every 1000 parts :—

Mutton	290	Milk	72	Rye	792	Cabbage	73	Cherries	250
Chicken	270	Wheat	950	Oats	742	Turnips	42	Peaches	200
Beef	260	Peas (dry)	930	Almonds	656	Melons	30	Gooseberries	190
Veal	250	Barley	920	Beets	148	Cucumbers	25	Apples	170
Pork	240	Beans (dry)	890	Potatoes	120	Plums	290	Peas	160
Fish, about	200	Rice	880	Carrots	98	Grapes	270	Strawberries	120
White of Egg	140	Bread	800						

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The Harvests of 1878.

ENGLAND.

A SURVEY of the growing crops from the Hundreds of Essex to the Marches of Northumberland, a tramp through several miles of fields, and the personal reports of correspondents from Bristol to Wisbeach, furnish fair grounds to form an estimate of the English harvest prospects of 1878, when the sheaves of grain are beginning to mark the landscape in most of our counties.

To "Peace with Honour," there are now excellent prospects that "Plenty" will be tacked by the abundant sunshine of the last month, that has already so far matured the wheat kernels that rain and wind now can do little more than reduce their quality and condition. Doubtless immense benefits have resulted from the hot weather of the last fortnight in June, and of the present month since the 4th ult., but the cereal season altogether has been much vilified, and given a bad character it did not deserve. The three chief requisites of a good year have been given—the fine seed time, the dry March that multiplies the plant stems, and the calm, hot flowering period; to mar which highly favourable conditions a wet May and early June postponed rather than marred harvest prospects, for the mean temperature of May was somewhat high than low, and the number of frosty nights fewer than usual.

The bad effects of May that remain are seen where the saucer-like hollows of low and level lands allowed the rain-water to remain and rob the plant of its vigour, so that now patches of sickly wheat that look blighted can be found in most fields, and what is called "under-corn," from the stems being short of the average, will be common. With one other drawback, that will be most noticeable in the early districts—the great growth of straw after, and not before, the ear was formed—the crops of 1878 are standing, at the present date, in a satisfactory state all over the country. Of the Wheat crop, the estimate may be put at 30 bushels per acre, yielding a total of about 13 million qr.—say 3 million qr. over last year's deficient harvest. Probably the total money value of the 1878 harvest of all crops, including hay, over that of 1877, will not be less than 50 million pounds sterling.

Of the Hay crop, at a thanksgiving service held last Sunday, a correspondent writes that a rector in the North called the yield in Cumberland and Westmoreland as "the largest within living memory; gathered, too, with unexampled rapidity and favourable weather;" and, excepting three weeks of rain that spoiled the early cut grass in forward districts, the bulk of forage grown throughout the whole country has been well saved.—*The Farmer.*

Harvest began early, many acres of Wheat being in sheaf before the close of July. Cutting went on most favourably through the earlier days of August, but a change of the weather was at hand, and violent storms of rain and wind interrupted reaping and reduced the thrashing machines to action. The rain was of course injurious, but the wind was strong enough to cause a brisk evaporation, and when the cycle of storm passed away from the island, harvesting again went on rapidly, although not so blithely or hopefully as before. Under blue skies, the farmer feared rain and hurried his corn home, sometimes carting it loose as cut. Four or five consecutive fine days passed, during which a great deal of work was done, and then there came another storm wave. A tropical downpour of rain accompanied the thunder and lightning, and the area of the electrical and atmospheric disturbance was exceedingly wide, embracing almost all the United Kingdom, with the exception of the East Kent and Essex coasts. Fairly fine weather succeeded this second interruption, but the damage done was serious, the corn thoroughly saturating at the most critical stage of harvest, when the maximum of corn was in the fields in shocks and sheaves. Grain was put out of condition, and the storms have their natural sequel in complaints as to the dampness of samples. Thus the harvest month has been at best a mediocre one. Reaping and thrashing have been twice seriously interrupted, and the expenses of the harvest have been materially increased by the uncertainties of the weather. The 1st of September has not in hand anything in excess of what the 1st of August promised; we must rather make a moderate deduction from the estimates of a month ago.

To turn to a consideration of those estimates, we find as general an agreement among leading authorities of 1878 as we found diversity of opinion among the same authorities in 1877. Everybody appears to be pretty well agreed as to the yield of 1878 being up to an average. A little *over* an average, say one or two, but opinion settles down to the generally accepted, if slipshod, formula of "a full average."

With this estimate, a careful review of reports from the different Corn-growing districts of the island has led us to concur. The home counties, the Southern counties, and the Midland, appear to have done better than either the Western districts or the Eastern counties; these latter especially have been irregular in their reports, soils apparently making the greatest difference to the yield in closely bordering districts. In the North, a crop 10 per cent. above an average was promised when July closed, but although the first few days of August favourably ripened some of the grain, yet the subsequent more or less unsettled weather has probably told injuriously upon the Wheat and the Barley. An unfavourable feature about this year's harvest is to be found in the fact that the best crops were from the lighter soils, the more or less unsatisfactory returns from the richer loams and clayey lands. But all drawbacks, taken together, do but lead us to the conclusion that considerably over an average crop was promised to us by the winter and early spring, and would have been favourably brought to maturity by the summer, had not six unfavourable weeks in May and the beginning of June done injury which reduced our crop to the average at which it actually stands.

Proceeding to statistical estimates, we thus divide the crop :—

	Qr.
1. *The Home Counties*—Kent, Surrey, Sussex, Middlesex, Essex, and Hampshire	2,250,000
2. *The Southern Counties* — Berkshire, Wiltshire, Somersetshire, Dorsetshire, Devonshire, and Cornwall	1,750,000
3. *The Western Counties*—Gloucestershire, Monmouthshire, Herefordshire, Worcestershire, Shropshire, Cheshire, and Wales	1,500,000
4. *The Northern Counties* — Yorkshire, Lancashire, Westmoreland, Durham, Cumberland, and Northumberland	1,500,000
5. *The Midland Counties*—Derbyshire, Staffordshire, Leicestershire, Warwickshire, Northamptonshire, Rutlandshire, Oxfordshire, Bedfordshire, Buckinghamshire, and Hertfordshire	1,750,000
6. *The Eastern Counties*—Lincolnshire, Nottinghamshire, Huntingdonshire, Norfolk, Suffolk, and Cambridgeshire	3,750,000
Total	12,500,000

If we add to this 1,000,000 qr. for the probable Wheat yield in Scotland and Ireland, we get a total of 13,500,000 qr. for the United Kingdom, from which, deducting 1,000,000 qr. for seed, we return to 12,500,000 qr. as the probable Wheat crop of the United Kingdom available for the bread supply of the new cereal year. How much this may prove deficient, owing to August storms, is most uncertain, but we believe a diminution of 500,000 qr. would be within the mark.

The quality of this year's Wheat has been seriously spoilt by the August rains, but a considerable quantity was got in before the more serious rain-storms, and a good deal of the remainder was harvested without suffering any serious injury. The well-secured grain will range from average up to excellence of quality. Perhaps 63 lb. per bushel may be taken as a mean weight, but 64 lb. is more frequent than 62 lb. or 61 lb. The rest of the English crop will very possibly average between 61 lb. and 62 lb. only. In Scotland, a good crop is promised.

Central Europe had a full average crop. The Austro-Hungarian monarchy is reckoned to have had an export surplus of 12,000,000 to 13,000,000 kentners, or between 2,900,000 and 3,200,000 qr. The yield in Prussia was put by the Government at 99-100ths of an average. This was an appreciable improvement on 1877, when the yield was, if we remember aright, 91-100ths only. Germany certainly exported considerably more grain than in 1877, and millers felt special interest in the news that in East Prussia, Pomerania, Posen, and Lithuania, whence comes the highly appreciated "Danzig" wheat, the crop was a *good* one, ranging from 3 to 10 per cent. over an average.

Holland and Belgium having had, according to reliable advices, fully average crops, would want less imports for 1878-9 than they required for 1877-8.

Italy and Turkey are believed to have had over average crops, though in the former country early thrashings were reported to disappoint expectations, and in the latter the cultivated acreage must almost inevitably have been reduced by the troubles of the recent war. The Italian crop helps the English miller in the negative way that Italy will stop but little Russian wheat, while Turkey may do something towards making up the "sundries" of the year's imports.

Algeria was believed to have had a good crop; but exportation had been in suspense, and there would seem to have been general disappointment on thrashing.

Spain had a moderate crop, with which the English market would not be much concerned.

France remains to be considered. Unlike the generality of European States, the French harvest of 1878 was inferior to the harvest of 1877. A series of violent storms had broken up the summer, and the worst weather had been experienced in the most important districts. As early as the middle of June, the extent of laid corn was very disheartening, and the middle of August saw the Wheat cut, but uncarried, on hundreds of thousands of acres in the very richest of France's agricultural districts. The yield, about an average in fortunate, was a disastrous failure in unfortunate, localities. Stocks were worked out, old grain was sold up, and the cereal year commenced with large importations of foreign grain. For 1878 France passed from among our sources of supply into the ranks of our competitors. For the whole cereal year, a moderate estimate would place the import wants of France at 4,000,000 qr. These 4,000,000 qr., we expect, would be supplied roughly as follows: —America, 1,000,000 qr.; Russia, 2,000,000 qr.; Austria, 1,000,000 qr. To replenish stocks, &c., and to allow a fair margin, France would probably be very well able to take another 1,000,000 qr. if Austria, Germany, and Russia had offered a surplus of grain at low prices.—*The Miller.*

The Agricultural Returns for Great Britain, issued Aug. 20, shew a small increase over last year in Wheat and Barley, and a decrease in Oats. The extent under Wheat has increased by 50,000 acres. Estimating Ireland at a little over last year, the total area of Wheat in the United Kingdom will be nearly 3,400,000 acres.

From the general appearance of the crop on the ground, and trials by thrashing already made in various parts of the country, there can be no doubt that the Wheat crop now being harvested is a full average, and the best we have had for some years. The increased acreage, and the additional produce, will afford us 11,500,000 qr. for consumption. We shall require 13,000,000 qr. more, for which we must look to our foreign commerce and to our Indian and Colonial supplies.

During the past harvest year, now drawing to a close, we shall have imported upwards of 15,000,000 qr. of Wheat and Flour. This is the largest import we have ever received; it has kept the price reasonably moderate, and the surplus has come mainly from the United States. The latest advices from that quarter shew that, while the great crop of 1877 is not yet exhausted, the prospect of the present crop is much less satisfactory. In France, the Wheat crop is believed to be below an average, so that we are likely to meet our nearest neighbours in the market as buyers rather than sellers. There is thus much probability of the present price being maintained, and, perhaps, slightly increased, but there will be no scarcity.

Up to this date, there is less disease in the Potato crop than there has been for several years at the same time. The extent of this important food crop is much the same as last year.—*James Caird.*

The returns of the imports and farmers' deliveries shew a home and foreign supply of 22,339,000 qr. for the year 1877-78, but this does not represent the actual consumption, which, for a population now estimated at 33,860,000, and a minimum consumption of 5½ bushels per head, amounts to 23,280,000 qr.

I estimate the outcome of this year's Wheat crop at 11,800,000 qr., being at the average rate of 28 bushels per acre on 3,372,590 acres. Deducting 800,000 qr. for seed, this would leave 11,000,000 qr. for consumption, and necessitate a foreign supply of from 12,000,000 to 13,000,000 qr.—*T. C. Scott.*

We have a considerably better series of crop reports to lay before our readers this year than any which they have read since the great crop of 1874; for although the Wheat crop is not, upon the whole, much more than an average, and Barley is decidedly under average, and Oats also do not reach the average, and Beans and Peas are largely failures; and although it is the lighter soils of the country (not generally the most productive of our bread corn) which have been especially favoured by the season, yet no such disastrous account of our produce has to be rendered as was true of 1875, 1876, and 1877. The following Tables give the number of reports which have reached us, classified as average, over average, and under average respectively. Of course, the returns are not individually of equal standing or importance; a return from Ross-shire, for example, which describes the Wheat as beyond an average crop, is far more than merely counterbalanced by one from Yorkshire or Essex, which pronounces it to be under average. When a considerable number of reports are lumped together, however, their individual differences may be nearly disregarded. And it will be found upon the whole, as we have said, that the Wheat crop, of which the over average returns more than balance in number those which declare it to be under average, is the best crop of the year. It is almost certain, indeed, that the crop will not perform all that its promise indicates. The thrashing machine will disappoint many a farmer who looks at the enormous bulk of straw he has to pass through it, and 1878 will be no exception to the rule which declares a wet, cold May to be fatal to a satisfactory yield of Wheat. The weather, however, has latterly been nearly all the Wheat grower could desire, and the yield will probably be greater than could have been expected just when the ear shot forth.

HARVEST RETURNS, 1878.

1878.	Wheat.	Barley.	Oats.	Beans.	Peas.
Over Average...	47	28	46	10	8
Average	115	89	103	88	76
Under Average	36	88	59	42	54
Total	198	205	208	140	138

PERCENTAGES OF CROP RETURNS.

1878.	Wheat.	Barley.	Oats.	Beans.	Peas.
Over Average ...	24	14	22	7	7
Average	58	43	50	63	55
Under average	18	43	28	30	39
Total	100	100	100	100	100

—*Agricultural Gazette.*

SCOTLAND.

The cereal crops of 1878 have been secured in excellent condition, and may be described as a full, well-matured, gifty crop. Green crops are also very satisfactory, and notwithstanding that Potato disease has lately shewn itself pretty generally, the loss of crop is not likely to be material.

Hay has yielded an unusually heavy crop of finest quality.

Wheat is generally over the average, both in quantity and quality. Weights, 62 lb. to 64 lb. per bushel. Barley has cut up much better than it looked before harvest, and the results on the barn floor warrant us in saying that we will have a large supply of bold, mellow, bright-coloured qualities, while distilling qualities will be good and sound. Weights, 54 lb. to 58 lb. per bushel. Oats on good well-farmed soils are a full crop, while on thin soils the bulk is small, but the quality of grain generally good. Weight, 41 lb. to 44 lb. per bushel. Beans are a full crop, and of good quality.

Potatoes are a rather large crop, in spite of disease. The quality is exceptionally fine. Turnips are a large crop, and although yellows have suffered pretty severely in some parts from finger-and-toe, the yield will be large; quality very good.—*Hope & Co.*

FRANCE.

Dividing France into tenths of Wheat land, the Paris Basin covers about three-tenths of the whole, that of Bordeaux two-tenths, Brittany and the North two-tenths. If Burgundy, Bourbonnais, and Limagne be included, the Wheat area of France may yield, as we should estimate—

Three-tenths rather under an average,
Two-tenths 20 per cent. short,
Five-tenths 30 per cent. short.

Thus, the nett yield of Wheat should be about 80,000,000 hectolitres, or say, in round figures, 28,000,000 qr., leaving importation to supply consumption with 5,000,000 to 6,000,000 qr. in a normal year, but allowing the nation to economize from their 4,500,000 acres of Buckwheat, their 3,500,000 acres of mixed grain and Maize, by substitutes for Wheat, the foreign supply will not probably exceed the 5,000,000 qr. An acreage of 8,000,000 in Oats, being a good yield, an abundance of Hay and forage and pastures full of keep will assist the country, but can hardly diminish the want for breadstuffs.—*The Farmer.*

AUSTRO-HUNGARY.

The annual Vienna Grain Fair was opened in August. The Secretary made an elaborate report upon the crops in Austria and Hungary, which he described as good in quantity, despite the unfavourable harvest weather.

The export capability of the entire monarchy is therein, after a judicious and careful analysis, calculated as follows:—

Wheat	5,740,000 qr.
Rye	1,150,000 ,,
Barley	2,480,000 ,,
Oats	2,020,000 ,,

UNITED STATES.

A general review of the crop reports gives promise of abundant harvests this year. With respect to Wheat, about 30,000,000 acres have been sown, an increase over last year in area sown of 15 per cent. for winter and 18 per cent. for spring Wheat. Although there has been an increase of acreage in many States, including New England, four-fifths of the entire crop will be produced by twelve States, viz., Pennsylvania, Tennessee, Ohio, Michigan, Illinois, Indiana, Wisconsin, Minnesota, Iowa, Missouri, Kansas, and California. The crop promises to exceed 350,000,000 bushels, of which 45,000,000 will be needed for seed, and it is estimated that we shall have a surplus of 70,000,000 bushels for shipment. This estimate is subject to some uncertainty on account of the weather which is to intervene between now and the harvesting of spring Wheat. But at present the reports, especially from the north-west, are all that could be asked. The probable increase in Wisconsin is fully one-sixth, in Iowa one-fourth, in Minnesota three-tenths, in Kansas one-third, in Nebraska four-tenths. The condition of the crop in these States is almost without parallel. The acreage of Maize is about 50,000,000. Illinois alone has

9,000,000 acres in Maize, and Iowa 5,000,000. The acreage of Maize has increased 20,000,000 since 1860. The prospect is for a fair rather than a great crop, which is usually the case in good Wheat years, although there are exceptional instances. It is yet too early to make any reliable estimate. The acreage in Oats is 10 per cent. greater than last year, and the yield will be above the average.

Years.	Bushels.
1868	224,036,600
1869	260,146,900
1870	230,884,700
1871	230,722,400
1872	249,997,100
1873	281,254,700
1874	309,102,700
1875	292,136,000
1876	256,000,000
1877	325,000,000

Although the Wheat crop of 1877 is the largest that this country has ever produced, yet, considering the much less than usual stock of old Wheat, the deficiency of the crop in California, and the augmented population, it is more than probable that the surplus available for export will not exceed that of the crop-year 1873-74, when the exports were—

	Bushels.
Wheat	71,039,928
Flour, 4,094,094 barrels, equal	20,470,470
Total exports of Wheat and Flour	91,510,398

Distributed as follows:—

To United Kingdom, Wheat	51,833,278	
To ditto in Flour, equal	5,000,000	
To Continental Europe	10,488,747	
		67,322,025
To other countries, in Wheat and Flour		24,188,373
Total to all countries in 1873-74		91,510,398

The two Wheat crops of 1873 and 1874 aggregated 590,357,400 bushels. The exports in 1873 were 52,014,715 bushels from a crop of 281,250,000 bushels, leaving large reserves to supplement the larger crop of 1874, from which the exports in 1874 were 91,500,000 bushels. The crop of 1875 was a comparatively small one, and a very large proportion of it was of inferior quality.—*New York Produce Exchange.*

ANNUAL AVERAGE GAZETTE PRICES OF BRITISH WHEAT.

	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867
70/	...	...	...	...	...	...	...	...	...	...
60/	...	...	...	...	...	...	...	...	...	64/5
50/	...	...	53/3	55/4	55/5	...	...	...	...	...
40/	44/2	43/9	...	...	...	44/9	40/2	41/10	49/11	...

	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877
70/	...	...	...	...	...	...	...	...	...	...
60/	63/9	...	...	...	...	...	...	...	...	...
50/	...	...	...	56/8	57/0	58/8	55/8	...	...	56/10
40/	...	48/2	46/10	...	...	...	...	45/2	49/9	...

PRINCIPAL CROPS.		1873.	1874.	1875.	1876.	1877.	1878.
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	England.........	3252802	3391440	3128547	2823342	2987129	3041241
	Wales............	116852	117869	111797	94423	100226	101813
	Scotland	120726	120991	102137	78192	81185	75363
	Great Britain...	3490380	3630300	3342481	2995957	3168540	3218417
Barley or Bere	England..... ...	1926183	1889722	2090423	2109265	2000531	2062498
	Wales............	163613	152425	154444	153647	147212	148116
	Scotland	246117	245840	264834	270197	269845	259038
	Great Britain...	2335913	2287987	2509701	2533109	2417588	2469652
Oats	England.........	1419128	1356739	1421951	1534249	1489999	1430376
	Wales............	244893	235621	237170	242417	239298	234986
	Scotland	1012206	1004024	1004888	1021764	1024882	1033545
	Great Britain...	2676227	2596384	2664009	2798430	2754179	2698907
Potatoes	England........	309419	314571	320477	707798	303964	301852
	Wales............	44936	45379	44505	42581	42942	40816
	Scotland	160327	160480	157671	154709	165565	165763
	Great Britain...	514682	520430	522653	505088	512471	508431
Turnips and Swedes...	England	1540307	1560857	1569049	1561116	1495885	1466973
	Wales............	70821	70843	70326	72049	70813	67531
	Scotland	510780	501636	503323	512408	506757	497356
	Great Britain...	2121908	2133336	2142698	2145573	2073455	2031860
Clover, &c., under rotation	England.........	2678311	2618655	2608106	2787103	2737387	2785097
	Wales............	360555	365078	360596	360159	351797	356486
	Scotland	1327952	1357009	1385369	1393011	1405032	1431524
	Great Britain...	4366818	4340742	4354071	4540273	4494216	4573107
LIVE STOCK.		Number.	Number.	Number.	Number.	Number.	Number.
Cattle	England	4173635	4305440	4218470	4076410	3979650	4034552
	Wales	642857	665105	651274	636644	616209	608189
	Scotland	1148057	1154846	1143080	1131087	1102074	1095387
	Great Britain..	5964549	6125491	6012824	5844141	5697933	5738128
Sheep	England	19169851	19859758	19114634	18320091	18330377	18444004
	Wales	2966862	3064696	2951810	2873141	2862013	2925806
	Scotland	7290922	7389487	7100994	6989719	6968774	7036396
	Great Britain..	29427635	30313941	29167438	28182951	28161164	28406206
Pigs *	England	2141417	2058781	1875357	1924033	2114751	2124722
	Wales	211174	213754	203348	215488	230720	218337
	Scotland	147668	150297	151213	154099	153257	140189
	Great Britain..	2500259	2422832	2229918	2293620	2498728	248324

Exclusive of those kept in towns and by cottagers with less than ¼ of an acre of land.

THE SUMMERS AND HARVESTS OF THE XIXTH CENTURY.

The Editor invites his Correspondents and Natural History observers to send, from their private notes, one more line of facts, so as to complete this condensed Summary.

Year.	Year's Temp.	Prices of Wheat. s.	d.	
1801	49.0	119	6	Summer fine. Food scarce. Wheat 151/2 in March. Average Wheat imports last ten years, 470,342 qr.
1802	47.5	69	10	July wet and cold. Year moderately fine. August hot and dry.
1803	48.2	58	10	June cold and wet. Summer fair. July and part of August hot and dry.
1804	49.5	62	3	Summer warm. September very hot and dry.
1805	47.7	89	9	Cold year, except autumn. Harvest hot and dry.
1806	50.5	79	1	Generally fine after April. Summer hot, especially June and July.
1807	48.3	75	4	May wet. Summer fine, and hot July and August.
1808	48.1	81	4	Fine summer. July very hot. Several deaths from sunstroke. A productive harvest.
1809	48.0	97	4	May hot. Wet summer. Bad crop. Temperature below average.
1810	48.7	106	5	Average yearly Wheat imports last ten years, 555,959 qr. Average rental, England and Wales, 17/3½. Wet and cold season. Bad crop.
1811	49.1	49	3	Wet and cold. Five-eighths of an average crop. Windy June.
1812	46.5	126	6	Wet and cold. Very bad crop. Worst year of the century.
1813	47.2	109	9	A great harvest—thanksgiving for it. Hot and dry season.
1814	45.8	74	4	Hot and dry.
1815	49.0	65	7	Hot and dry. Summer temperature, 62.10
1816	46.4	78	6	Wet and cold. Summer temperature, 58.37.
1817	47.7	96	11	Very wet August. September fine. Summer temperature, 60.30.
1818	50.8	86	3	Very hot summer. Seventeen weeks' drought after 8th May. Summer temperature, 65.60. Over an average crop.
1819	49.3	74	6	Severe frost May 28. Hot summer, July, August, and part September. Temperature, 63.27.
1820	47.4	67	10	Average yearly Wheat imports last ten years, 429,076 qr. Hot and dry. Summer temperature, 60.48.
1821	49.3	56	1	Wet and cold. Summer temperature, 59.37.
1822	51.0	44	7	Hot summer, June and August. Nine weeks hot; no rain from May 2 to July 5. Temperature 63.10. Full crop, of very fine quality.
1823	47.3	53	4	Wet and cold. Temperature, 60.35. Forty-seven days' raining—June 29 to Aug. 15.
1824	48.3	63	11	Great hailstorms. Wet summer. Good hay. Bad corn crops. Temperature, 61.58.
1825	49.6	68	6	Fine summer. Temperature, 62.57. July very hot and dry, 97.0 in shade, registered. Early and good harvest.
1826	49.9	58	8	Fine summer throughout. Very hot. Temperature, 65.92. Fine crop.
1827	48.5	56	9	Summer temperature, 60.93.
1828	50.1	60	5	Wet and cold. Heavy rain—July 6 to August 14. Summer temperature, 60.59.
1829	46.6	66	3	Rain from June 16 to September 20, except four days. Summer cold. Temp., 58.81.
1830	47.8	64	3	Average yearly Wheat imports last ten years, 534,762 qr. Cold summer. Temp., 59.50.
1831	50.4	66	4	Severe frost May 5, doing great damage. Summer wet. Temperature, 62.58.
1832	49.1	55	8	Summer temperature, 60.97.
1833	49.0	52	11	Wet and cold. Summer temperature, 59.25.
1834	51.0	46	2	Much heat and drought from June to October 7. Summer temperature, 62.34. One of the best harvests known.
1835	49.2	39	4	Hot early in June, through July and August. No rain from July 5 to August 25. Summer temperature, 62.46. Good crop, much straw.
1836	48.1	48	6	Summer temperature, 61.73. Medium crop.
1837	47.3	55	10	Hot and dry. Summer temperature, 61.42.
1838	46.4	64	7	Summer temperature, 60.52.
1839	47.7	70	8	Wet and cold. Summer temperature, 60.63. Wet September. One Wheat stock produced 2800 grains from 64 straws.
1840	47.8	66	4	Dry spring and summer. Hay, small crop. Average yearly wheat imports last ten years, 908,118 qr. Temperature, 60.87.
1841	48.7	64	4	Wet summer and autumn; cold. Summer temperature, 58.91.
1842	49.6	57	3	Dry summer. Temperature, 64.11. August very hot; drought severe; destructive hailstorms.
1843	49.4	50	1	Good hay year. August 24, 2 inches rainfall. Summer temperature, 60.66.
1844	48.6	51	3	Drought and heat from early in April throughout summer. Winds veering with sun. Temperature, 60.44.
1845	47.6	50	10	Very wet summer, and cold. Temperature, 59.86.
1846	51.3	54	8	Very dry summer, June to September 22. Temperature, 64.81. Very good crop.
1847	49.6	69	9	Very dry. Temperature, 61.88. July and August hot. Failure of Potatoes. Wheat, 102/5 in May; in September, 49/6, after fine harvest.

Year.	Year's Temp.	Prices of Wheat. s.	d.	
1848	50.3	50	6	Wet spring, then drought, cold, wet summer. Temperature, 60.40. Crop, short.
1849	49.5	44	3	Fine after snowy spring. Summer temperature, 60.84. Corn admitted to United Kingdom, 1/ per qr. Winds veering with sun. Harvest good.
1850	—	40	3	Wet and cold. Deficient harvest. Summer temperature, 60.1.
1851	—	38	6	A good, but late crop. Average temperature.
1852	—	40	9	July very hot. Large area, good early promise, damp and very inferior, harvest ripened prematurely, weight light. Wet August.
1853	—	53	3	Small area. Wet autumn and spring. Worst crop for years, 14⅞ bushels. Wind veering against sun. August temperature, 59.0.
1854	—	72	5	One of the best crops on record, fine quality, large area, 35½ bushels.
1855	—	74	8	Quality various, slow harvest, yield nearly an average, 27⅝ bushels.
1856	—	69	2	Full area, rather wet harvest, quality irregular, 29 bushels. Hot and dry summer. Winds veering with sun. August temperature, 63.6.
1857	—	56	4	Great heat, and mostly dry from May 11 to September 27. Early and large harvest, quality fine, 35⅝ bushels, full area. Summer temperature, 62.0.
1858	—	44	2	Hot and dry summer to September 22. Bulky, early, good harvest, fair yield, 32⅛ bushels. Winds veering with sun. Summer temperature, 61.9.
1859	—	43	9	Very hot summer, July excessively so. Fair promise, early ripening, bulky sheaves, yield below average, quality inferior. Summer temperature, 62.8.
1860	—	53	3	Deficient crop, condition bad, harvest three weeks late, cold, wet, stormy, 25¼ bushels. Winds veering against sun. August temperature, 56.7.
1861	—	55	4	Small area, yield deficient, quality good, 26⅞ bushels. Bad French crop.
1862	—	55	5	Large area, good early promise, result very bad, quality and quantity, 31⅜ bushels. Cold summer.
1863	—	44	9	Fine and dry summer, mostly hot. One of finest crops known, enormous produce of fine quality, 38¾ bushels. Another estimate, 17,000,000 qr. grown. August temperature, 61.3. Wet June.
1864	—	40	2	July 4 to August 21 severe drought, dry year, good harvest, began August 2, fine quality, 35⅛ bushels. Another estimate, 16,000,000 qr.
1865	—	41	10	Great rain at times. Drought and heat August 27 to October 8. Harvest damaged by storms, began July 31. Estimate, 14,200,000 qr.
1866	—	49	11	Slow, showery harvest, began August 8, yield and condition middling, 25½ bushels. Rainfall, 29.4, Chiswick. Estimate, 12,600,000 qr.
1867	—	64	5	Yield deficient, quality inferior, promised well June and July, 21¼ bushels, began August 10. Estimated, 12,000,000 qr. Bad French crop.
1868	—	63	9	May 2 to September 21, great drought and heat. Harvest began July 18, very bad hay crop, very large wheat crop. Estimated, 16,000,000 qr.
1869	—	48	2	Large acreage. Estimates opposed.
1870	—	46	10	Drought and much heat from middle of May to August 22. Fine, still blooming time, yield a full average. 14,800,000 qr.
1871	—	56	8	Early harvest, but estimated only 10,500,000 qr. Bad French crop, 78,000,000 hectolitres. August temperature, 64.6.
1872	50.7	57	0	June, July, September warm, August below mean. Short crop, 26⅛ bushels.
1873	48.9	58	8	April, May, June below; July, August above mean temperature. Bad crop.
1874	49.3	55	10	May, June, August below; July and September above mean temperature. Abundant harvest in United Kingdom, France, and generally.
1875	49.4	45	2	February, March, April below; May, June, August above mean temperature. July, 3.5 below. Deficient harvest, 10,000,000 qr. in United Kingdom, but well got. Cold and dry spring, floods in autumn. Heavy snow November, December. Average in France, 95,000,000 hectolitres.
1876	50.0	46	2	Very hot summer. Easter snowy and very wintry, after wet autumn and cold, droughty spring; May dry, cold, and often very frosty first three weeks; afterwards fine and warm. June fine, but variable. Wheat bloomed very favourably fourth week. July very hot, 3 deg. above mean temperature. August first days wet, then intensely hot 6th to 23d. On 13th, mean heat 14½ deg. above average. Harvest period generally fair. Deficient harvest (the second), estimated variously at only 9,600,000 qr. to 11,500,000 qr., quality good, and mainly very superior and in finest condition. Total yield very disappointing. Returns to *Agricultural Gazette*, 119 average, 36 above, 117 below average. Breadth under cultivation very small; Barley, Beans, and Oats all under average. Later estimates of Wheat harvest, 10,500,000 qr. French harvest nearly an average.
1877	49.7	56	9	Deficient harvest (the third). Quality of the grain very inferior. Autumn and winter seed time favourable, acreage increased. January and February mild and rainy; March variable and colder than February; April harsh and unseasonable; May cold and ungenial up to Whitsuntide, fair afterwards; Wheat plant reckoned a fortnight late, and often of a bad colour.
1878	—	—		An average harvest south, over an average harvest north, of the Tweed. Crop much deteriorated by rains in mid-harvest. Estimated yield, 12,000,000 qr.

RECORDS KEPT BY MR WILLIAM EXLEY OF WISBEACH.

Years.	Peeping of Wheat-ears.	Beginning of Harvest.	Days.
1834	May 24	July 18	55
1835	June 10	Aug. 4	55
1836	,, 15	,, 8	54
1837	,, 17	,, 16	60
1838	,, 17	,, 14	58
1839	,, 12	,, 9	58
1840	May 31	,, 10	71
1841	,, 31	,, 8	69
1842	June 7	,, 9	63
1843	,, 6	,, 11	66
1844	May 30	,, 1	63
1845	June 16	,, 16	61
1846	,, 2	July 30	58
1847	,, 15	Aug. 4	50
1848	May 29	July 27	59
1849	June 8	Aug. 11	64
1850	,, 12	,, 12	61
1851	,, 6	,, 6	61
1852	,, 8	,, 4	57
1853	,, 10	,, 10	61
1854	,, 6	,, 8	63
1855	June 16	Aug. 18	63
1856	,, 10	,, 13	64
1857	June 3	July 31	58
1858	,, 2	,, 26	54
1859	,, 2	,, 28	56
1860	,, 13	Aug. 21	69
1861	,, 8	,, 2	55
1862	May 31	,, 6	67
1863	,, 29	July 29	61
1864	June 1	Aug. 4	64
1865	May 31	July 29	59
1866	June 4	Aug. 6	63
1867	,, 5	,, 12	68
1868	May 25	July 17	53
1869	June 8	Aug. 6	59
1870	,, 4	July 28	52
1871	,, 17	Aug. 10	64
1872	,, 10	,, 2	53
1873	,, 4	,, 4	61
1874	,, 3	July 28	55
1875	,, 3	Aug. 6	64
1876	,, 17	—	—
1877	,, 18	—	—
1878	,, 9	Aug. 5	57

Averages taken from the above Table each succeeding 14 years :—

	Earing.	Reaping.	Days.
1834 to 1847	June 8	August 7	60
1848 to 1861	,, 7	,, 7	61
1862 to 1875	,, 4	,, 2	59

Early and late periods of earing :—

13 early years, May 24 to June 2......... Reaping 61 days afterwards.
15 average years, June 3 to 8 .... ,, 61 ,,
14 late years, June 10 to 17 .... ,, 58 ,,

Early and late periods of reaping :—

14 early years, July 17 to August 2......... Average, July 27.
15 average years, August 4 to 9 .... ,, August 6.
14 late years, August 10 to 21............... ,, ,, 13.

Average date of reaping for 42 years—August 5. Average of earing 44 years—June 7.
Average number of days between earing and harvest—60 days.

ESTIMATED AVERAGE YIELD, PER STATUTE ACRE, OF THE PRINCIPAL CORN CROPS AND OF POTATOES, IN IMPERIAL BUSHELS, IN VARIOUS FOREIGN COUNTRIES.

Countries.	Date of Returns.	Wheat.	Barley.	Oats.	Rye.	Beans and Peas.	Maize.	Potatoes.
		Bushel.	Bushel.	Bushel.	Bushel.	Bushel.	Bushel.	Bushel.
Austria (Proper)	1871	15.2	17.0	19.2	14.7	11.1	15.1	81.5
Bavaria	1863	16.3	20.1	22.5	16.3	15.3	24.9	103.4
Belgium	1866	20.3	34.9	41.2	24.6	23.2	—	—
France	1872	19.3	21.5	28.2	17.4	17.0	—	101.3
Greece	1867	13.2	18.8	19.0	—	—	17.4	—
Holland	1872	25.3	41.1	42.6	22.1	25.9	—	165.0
Norway	1870	22.1	30.3	35.7	25.9	*20.5	—	—
Prussia	1867	17.1	25.1	32.9	16.7	17.5	—	—
Portugal	1865	8.9	11.1	18.6	6.7	—	20.0	—
Spain	1857	23.3	24.3	—	8.4	—	—	—
Sweden	1872	—	—	—	—	11.6	—	103.1
United States	1873	12.7	23.1	27.7	13.1	—	23.8	81.9
Wurtemburg	1873	15.5	21.6	27.9	15.4	17.8	18.0	105.0

* Beans.

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Monthly Kalendar of Farm Work.

JANUARY.

Ploughing.—If the state of the weather and soil are favourable, push on rapidly with the ploughing. In no case take in hand the ploughing when the soil is saturated with wet—good work cannot result: this holds more especially true of heavy adhesive clays.

Drainage.—When the state of the land and weather are favourable, proceed with drainage operations in the field. [For full descriptions of method of draining, see Stephens' "Manual of Practical Draining," or chapter on Draining in Morton's "Young's Farmers' Kalendar."]

Wheat Crop.—If the condition of the soil permits, proceed with what remains to be done in wheat sowing. [For remarks on this crop, see introduction to the month of October in this Kalendar.] In the choice of seed, the farmer will be guided by the locality and condition of the field; a red variety may be used if these are favourable to the early ripening of the crop; if not, a white.

Beans, Tares, and Peas.—In good soils and favourable situations these crops may be laid down; the beans to be sowed in drills at least 28 or 30 inches in width. By sowing a mixture of tares and rye, a good supply of forage in spring for cattle may be obtained. In the great majority of localities it will be too early to put down peas; a few, however, in good soil may be sown.

If the *Turnip* lifting has not yet been completed, proceed with this operation, removing the tops or shaws, care being taken not to cut or injure the bulbs in removing the tops. Turnips are piled up in triangular heaps, having a base of about 6 feet, and thatched with straw. When consumed in the field, the produce of three rows may be thrown into one, and covered with the plough. When turnips run to seed they become woody.

Cattle.—The food of cattle fattening for market should be made richer by the addition of oil-cake or bean meal. A "soup," such as recommended by Mr Lawrence, will push on cattle quickly for the shambles. Grazing cattle will not be the worse for a slight addition to their food in the shape of turnips and a modicum of rape-cake. [The reader is here referred to the remarks under this head in the month of October, shewing the necessity of attending to the care of cattle during the winter months.]

Calves and Cows.—The calves should not be subjected to biting blasts of winter in cold exposed fields and during damp weather. They should be carefully attended to in warm sheltered sheds and courts. This remark applies with equal, if not greater force, to the milch cows; for it may be taken as axiomatic, that if the food, the shelter given to, and the care taken of, dairy cows are not given as they ought to be, the supply of milk will not be at all satisfactory. [For remarks on this head, see month of October.]

Horses.—The same care which we have urged upon the attention of the reader with respect to cattle and dairy stock are just as necessary in the case of horses—perhaps more so, in view of their greater individual value. Good, careful grooming, regular feeding, supply of good water, plenty of fresh air, and regular exercise are the points to be attended to.

Sheep.—Supplement turnips and straw food with a supply of oil-cake, beans, or oats, and provide shelter from the cutting winds. Keep ewes near their lambing time in separate folds, and those about to lamb in warm shelter sheds. Pay great attention to the quality of the food given to ewes, and avoid the use of frosted turnips and early got up mangolds, which are apt to scour; mangolds are all the better for being stored up for a month or two.

Pigs.—Keep pigs warm, and well but not over supplied with food, Boil the roots given to them, and mix with bran and sharps. Sows near littering to be kept quiet and warm. In giving food to pigs do not forget a supply of small knobby lumps of coal; they are better for them than cinders; but cinders of even an inferior quality are better than none. The beneficial action of coals upon the health of pigs is very decided; how they act is not known very precisely: the subject is curious, and deserves to be investigated.

Miscellaneous.—Prepare compost heaps; thrash out grain for market; dung and clean out all the court-yards, feeding-boxes, byres, stables, &c., at regular intervals; adjust the store of straw for bedding, and food for the stock, so that no time may be lost in looking to the comfort of the stock,

FEBRUARY.

Ploughing.—See remarks on this department in last month. A furrow of average depth should be taken if the turnip crop has been wholly removed; a shallow furrow if the turnips have been eaten off with sheep.

Drainage.—See last month. Care should be taken not to leave the trenches open to be attacked by frost. The filling in should be done as rapidly as possible after the trenches are cut.

Wheat Crop.—Proceed with the sowing of such fields as may not yet be done; select a variety which will mature early, and with a stiff straw; dress with "Down's Farmers' Friend" or other wheat steep before sowing; and apply a phosphatic manure.

Beans, Tares, and Peas.—See remarks last month.

Barley.—Although usually sown in March, if locality and soil are both favourable, it will be worth while for the farmer to sow down a limited breadth of this crop, for it is worthy of note that the early-sown barleys are better than the late.

Oats.—Land in good condition—that is, dry, rich, and with a fine tilth—may be laid down in oats this month, towards the middle or latter end.

Cattle.—It is a maxim in cattle feeding, based upon sound principles, that the improvement in the condition of fattening cattle should be a constantly progressive one; no going back should be tolerated, for the same rates of improvement cannot be again attained. Be careful, therefore, to attend to the regular, steady feeding of stock. In place of keeping them always on the same kind of food, study to give them from time to time changes. The importance of a change of food to cattle has not been fully recognised, important as it is admitted to be in human hygiene. In the varied foods now at the command of the farmer, there can be no excuse for not attempting this change. The care of the farmer at this period of the year in this department is to get the cattle fitted for the fat cattle markets; to aid in this, the advantages of this "change" system will be apparent upon a steady trial of it. It increases the appetite and promotes the assimilation of the food. An excellent fattening food is made of oil-cake, rape-cake, bean meal, and oats or barley; nor should a little condimental food or addition to the food be despised.

Calves and Cows.—Keep the calves in dry and warm shelter sheds, well supplied with food, of which the kind, the quality, the quantity, and the mode of giving must be proportioned to their age. A little salt should not be forgot, and a lump of chalk should be placed within their reach. Cows giving full milk must not be let down; the addition of a little rape-cake and cabbage as green food will be found to add to their milking capabilities. At the same time, it should not be forgot that what will suit one cow will not suit another. Hence the value to the farmer of the "change" system of food which we have advocated on the feeding of fattening stock. We have no hesitation in saying that this plan of carrying out an unvarying system of feeding in the case of farm stock of all kinds is as unphilosophical in principle as it is productive of unsatisfactory results in practice.

Horses.—The work of horses on the farm having been increased by this time, the corn supply should in proportion be increased. Do not let long intervals elapse between the times of feeding; long fasts are as prejudicial to horses as to men.

Sheep and Ewes.—An allowanee of oil-cake or other oleaginous food should be added to sheep folded on the turnip brake. The importance of warm shelter to sheep is rapidly becoming recognised, although the practice is, we regret to say, as yet very limited. It is strangely suggestive that while the importance of warmth to fattening cattle and dairy stock is quite undisputed, its importance to sheep should have been so long in being recognised. The ewes near lambing must be carefully looked to, kept quiet, well fed; and shelter should be provided for the coming lambs.

Pigs.—Feed up pigs intended for killing. Oatmeal or Indian corn meal, during the last three weeks, given in unstinted quantity, will be found excellent in giving what has been somewhat artistically called the "final polish off" or the "finishing touch." Breeding sows must be attended to; cooked potatoes or mangold will be relished, all the more so if a little salt or some condimental food be added. Warm mashes should also be provided to the sows having litters.

Miscellaneous.—Cart manure to the fields whenever the horses are at liberty, the hard frosty weather being chosen if possible; prepare compost heaps; thrash out grain; repair roads; collect all odds and ends about the steading; and dung out the feeding places.

MARCH.

Ploughing.—The remarks made under the month of January as to ploughing when the land is in a fit state, apply here forcibly to the operations of this month. The soil when turned over by the plough, should be in a fine friable condition, not adhesive, cloddy, or lumpy. It should be remembered that the condition in which the soil is for seeding, and in which it is left after seeding, influences, in a very marked manner, the after cultivation of the crop during its growth, and, by consequence, its final result.

Wheat Crop.—Little land should have to be laid down for this crop so late on in the season; the only varieties admissible where it has to be done being the April or bearded wheat and Talavera.

Barley.—The sowing of this crop should be regularly proceeded with. The soil is in best condition when friable, moist, but not wet. In selecting the seed, it is a good plan to procure seed from an early district. Chevalier barley stands highest in the estimation of brewers for malting purposes; the four-rowed variety (bere or bigg) yields heavy crops, but the quality is coarse, and not valuable for malting.

Oats.—Proceed with the sowing of this crop, care being taken to have the soil in a favourable condition, and the seed selected of an early variety.

Beans.—Early in the month the seed should be sown if possible in drills, in order to enable cleaning and weeding to be carried on; and the soil should be well manured.

Tares and Rye, for a supply of green food for cattle, may be sown in drills.

Flax.—Land intended for flax demands particular attention now. The land should have been deeply ploughed last autumn, and should, as soon as sufficiently dry, be well harrowed, rolled, grubbed, and well cleaned of all root weeds, such as scutch, crowfoot, &c. The best soil for flax is a deep, strong loam; and rich stubble land, after wheat, oats, or barley, produces the best sample, particularly if the grain crops have succeeded lea; the seed may be sown by the end of the month, and well harrowed with a short-tined harrow, first one way, and then across, or diagonally, so as to distribute the seeds equally; finish with the roller. It is much safer to sow too thick than too thin. Good crops are taken after potatoes, mangolds, carrots, and parsnips; but there is a decided opinion in the north of Ireland against growing flax after turnips.

Spring Vetches.—Sow another breadth of this valuable crop for summer soiling. When well up sow another breadth, in order to keep up a continuous succession of succulent forage. About four pounds of rape, sown along with the vetches and oats, will help to keep the former off the ground, and add considerably to the bulk of the crop.

Carrots love a deep, sandy loam, which, when well manured with well-decomposed compost, intimately mixed with it, produces this crop in the highest state of perfection. On this account the best practice is to manure the land heavily in the autumn, and plough it in with a deep rough furrow; it is then harrowed down, as soon as thoroughly dry in the spring, cross ploughed, well harrowed, rolled, and, if necessary, well grubbed and rolled, so as to reduce it to the finest possible tilth, preparatory to forming the drills, which are then rolled to flatten their tops and consolidate them, and immediately sown. If the land has not been manured in the autumn, it may be manured at the time of sowing, and put in the drills as is usual for turnips. Carrots may be sown from the middle of the month up till the middle of April, but the earlier the better.

Parsnips like a deep, sappy, heavy soil, not wet; and to produce a heavy crop, it should be rich and well manured with rich compost. The cultivation of the soil is the same as for carrots, and the seed may be sown at the same time; but carrots will produce better if sown a little later than parsnips.

Cabbages.—Prepare a clean, rich, and well-manured piece of land, and pulverize it well, to sow some cabbage seeds; lay it off in three and a half or four feet beds, with eighteen-inch alleys; level the beds neatly with the back of the spade; sow the seed thinly and evenly, and cover with about an inch of fine earth from the furrows, rake the surface nicely, and when dry enough beat it well with the back of the spade, which will prevent it cracking or fissuring. The large York, Nonpareil York, and Drumhead are the best sorts to sow now for field culture, and will produce fine plants for planting out in May and June.

Kohl-Rabi.—Sow early in the month on a well-manured seed bed, for plants for transplanting.

Potatoes.—The land for this crop should be stirred over with the grubber rather than turned over by the plough. Liberal manuring, with phosphatic guano or first-class superphosphates, should be attended to.

Grass Seeds and Clover.—In lands sown with wheat and barley grass seeds and clover should be sown; the seed should be covered very lightly with a light bush or grass seed harrow; or, in some soils, better still, with a light roller. Be very careful as to the purity of the seeds selected; by using cheap seed a great loss may be sustained. In this department, perhaps more than in any other connected with farming, is the saying applicable, "Penny wise and pound foolish," where cheap, impure, weedy is preferred to dear but sound and clean seed.

Cattle.—See remarks under last month. Those to be sent into pasture in the coming spring will be all the better if they receive, for some time before they are put out, a little extra nutritious food, as oil-cake or the like.

Calves and Dairy Cows.—See remarks under last month. Cows in milk should have their food given them in a warm and moderately soft or liquid state.

Horses.—The addition of carrots to horses will be found to improve their condition greatly. Warm mashes will be useful, if not as a regular portion of their food, yet as occasional. Oats, beans, and hay should form the staple of their food; but whatever is deemed best, consult regularity in feeding, and do not neglect a supply of pure water.

Sheep and Ewes.—See remarks under last month. The ewes about to drop lambs should be provided with warm shelter sheds during the night; they may be turned out if the weather is moderately open during the best part of the day, but not towards early morning or evening, especially if the winds are cold and the weather damp.

Pigs.—See remarks under last month. See that the feeding pigs get each an equal share of food; the weak must be guarded against the tyranny of the strong; if not, some will be gorged, others starved.

Miscellaneous.—Buy and prepare artificial manures; cart in manure to the fields; collect materials for and prepare compost heaps; attend to the tidy condition of all about the steading.

APRIL.

Ploughing.—Land intended for green crops should only be ploughed where the soil is in that sound condition which will work freely under the plough, yielding a fine friable soil under the final action of the harrows. In working the land for turnips, some prefer the grubber to the plough, as it brings the weeds better to the surface, and, upon the whole, leaves the land in a state better suited for the crop than if the plough was used. Plough lea land, and seed after the ploughing, harrowing in the direction of the furrow both before and after the sowing.

Drainage.—All the fields which are to be under crop, and the drainage of which has been begun in the preceding month, must now be finished.

Barley, Oats, and Beans.—The sowing of these crops must be completed this month, and as early as possible. Every exertion should be made to secure favourable conditions of soil and weather for these crops. A chance now lost may never come again.

Flax.—See remarks for last month.

Carrots, Parsnips, and Cabbage.—Carrots and parsnips must be sown this month, if a good crop of each is desired. Cabbage should be planted out at distances varying from 28 to 36 inches.

Potatoes.—The ploughing for this important crop should be proceeded with most vigorously; the land should be in good condition, richly but not over-manured.

Mangold Wurtzel.—Towards the end of the month this seed should be sown, in drills 28 to 30 inches apart, the same as for turnips. The crop requires heavy applications of manure, in which, if salt is given at the rate of 2½ cwts. to the acre, the crop will be all the better. The seed should be steeped in a weak solution of nitrate of soda, or even pure water, for two or three days before sowing.

Grass Seeds.—These are usually sown down with the barley, although, as stated in last month, sometimes with the wheat crop. [For operations, see the last month's remarks under this head.]

Cattle.—If the supply of potatoes be good, the fattening cattle may have an addition of a few to the turnips, upon which they are mainly fed, say in the proportion of one-third potatoes to two-thirds turnips. The oil-cake and meal, in small quantities, should form a regular part of the food. If the tares and rye are sufficiently forward by the end of the month, a little added to the straw given to young stock will bring them rapidly forward. If these green foods are not obtainable, grass may be given.

Cows.—Green food, if attainable, should be now added to the food of cows in full milk. In this way the advantage of the produce of an autumn-sown break of winter rape will be very marked. It is wonderfully liked by cows, and adds materially to the milk which they give.

Calves.—See remarks under March.

Horses.—Being now in full work, every attention to the feeding and grooming must be given—regular feeding at short intervals, not exceeding five hours, is essential. Break colts to the yoke gradually, and with "gentle firmness." An hour's harsh and violent treatment of a colt under "breaking-in" will do away with the good effect of days of a contrary treatment. Humanity in this department is the best policy. *Mares* near foaling to be kept in loose boxes, with regular food. A due amount of exercise should be given.

Sheep.—Keep up the condition of fattening sheep by regular, careful feeding. Ewes with lambs should be supplied with food to act upon their flow of milk. Studiously keep both them and the lambs from exposure to cold, wind, and rain.

Pigs.—Pigs which have up to this time been preparing for, will now be ready for sale. Young litters, with their mothers, should be regularly fed and kept warm, and well supplied with clean dry litter.

Miscellaneous.—Turn over dung in the courts; cart ditto to the fields; top dress meadows and pasture fields; roll fields and growing crops carefully so as not to injure the young plants; gather up and collect together the stones, broken pots, &c., from the surface of the meadow lands; thrash out grain for market; keep all about the steading tidy; look out and put in order all implements used in spring, as corn drills and the like; clean out ditches, and repair fences.

MAY.

Ploughing.—The work under this department is chiefly confined to the preparation of the summer fallows. The first operation in advanced farming being the grubbing or scarifying of the surface soil, so as to stir and bring the weeds to the surface, the grubber being worked first in one direction and afterwards across that of the original furrows. The grubber for this work is preferable to the plough, which does not act so favourably upon the roots of the couch grass and upon the other weeds.

Beans, Peas, Tares.—All the land under these crops should be carefully hoed and freed from weeds, and the soil brought well up over the root. Much of the value of the resulting crops depends upon the perfect way in which the stirring, hoeing, and cleansing of the soil are effected.

Mangold Wurtzel, and Potatoes.—Work on vigorously with the sowing of these crops, if not already completed. [For remarks, see last month.]

Turnips and Swedes.—The land should be prepared for the turnip crop; the weeds should be got rid of as carefully as possible; the soil to be in good tilth and well manured.

Cattle.—Keep up the system of regular steady feeding. By this time much supplementary food may now be obtained. Mr Lawrence's mode of feeding will be found useful now.

Cows.—In full milk, cows require careful attention in regard to kind and quality of food. [See remarks under last month.]

Horses.—See remarks under March.

Sheep.—Sheep which are to be shorn this month should be washed some week or ten days before. The operations of both washing and shearing are too frequently performed in a very slovenly, careless way. It is of importance that both should be carefully done in view of the value of the wool.

Pigs.—The addition of some green food, grass, rape, rye, or tares, will be relished by pigs along with their ordinary food. Cooked potatoes, turnips, or mangolds, will form the staple of store pigs' food. Sows with litters should have occasional, if not regular, warm mashes given to them.

Miscellaneous.—Collect dung from the various courts and feeding-places, and place in dung heaps; turn over composts; purchase and prepare artificial manures; top-dress grass fields and grain crops; repair fences and walls, and clean out the ditches, &c.; keep tidy all about the steading; and do not neglect the condition of implements and machines.

JUNE.

Ploughing.—Proceed with summer fallowing in cases where it is deemed advisable to adopt the system. [See remarks under last month.]

Draining.—The summer months are very suitable for carrying on draining operations in lands under grass and on fallow.

Weeding.—All the crops now in progress of growth, and which are capable of being brought under the action of the hoe—hand or horse—should be attended to. The adage is worth remembering, "One year's seeding (of weeds) is seven years' weeding."

Mangolds.—When sown at the proper time, the plants of this most important crop will be so far advanced as to admit of their being trimmed and singled. This should be done by hand, if a good after-crop is wished for; no machine *can* do the work properly. Take advantage of the opportunity to clean the weeds from between the drills or rows, and stir the soil well up.

Turnip Crop.—Proceed vigorously with the sowing of the turnips; with regard to this crop no opportunity should be lost to get the seed in early this month. "Now or never" should be the farmer's motto at this time. Some of the early-sown *Swedes* will now be ready for hoeing, weeding, thinning, and singling. [See paragraph above.]

Haymaking.—This, one of the most important operations of the year, will now—in favourable localities and seasons—be engaging the attention of the farmer. Space does not here permit us to go fully, nor is it necessary to do so, into the details of the work of the hay field.

Cattle.—Cattle will now be fed chiefly, if not altogether, upon grass, either from the pasture field, or supplied to them in the fold. The latter, known as "summer soiling," is a system highly thought of by some, and if care has been taken to secure a good breadth of land under rape, rye, and tares, and white mustard, its advantages will be at once apparent. Cattle nearly ready for the shambles will be all the better for the addition of a little oil-cake and meal with their green food. The supply of water should be looked to.

Cows and Calves.—Chiefly fed in the pasture fields, and out therein all day, it will be advisable to house them during the night; previous to locking them up give each cow a supply of green food and a "leetle bit of cake." Rape cut green will be amazingly relished by the calves, and in many cases they may be turned out altogether into the pastures. More satisfactory results will however be obtained if they are summer soiled in courts and sheds, a little cake or meal being added to their supply of grain food.

Horses.—See remarks under last month. The hard work which is now their lot must be met with increased care and attention in their regular feeding. Housing at night in the yards or hammels, or in well ventilated stables, will be found better management than leaving them in exposed pastures. The mares should now be served; remember the adage, "Like begets like," so avoid a false economy in providing "old screws" as the probable source of wretched colts.

Sheep.—See remarks under last month as to watering and shearing. After shearing use a "wash" or "dip" to kill vermin, and render them less liable to be attacked by flies in the hot summer months. A portion of the tails of lambs, male and female, may be cut off this month, and the tup lambs castrated.

Pigs.—Large additions of green food should now be given to pigs, and if a field is available, a run for some hours a day should be afforded them. This should not be done in the hottest part of the day in sunny weather, unless shelter in the field is within their reach. The whey, sour, and skim milk from the dairy, and the swill from the kitchen, should be saved and given to the store pigs.

Miscellaneous.—Keep the courts and roads in good condition; top dress meadows after the first crop of hay is taken off; prepare manure for turnip crop.

JULY.

Ploughing and Draining.—The work connected with summer fallows should be proceeded with, and the manure applied where necessary. The drains should be finished by the latest at the end of this month, so as to free all hands for the labours of the harvest now nearly at hand in some of the early districts.

Weeding, Hoeing, and Cleaning of Growing Crops.—All the strength of the farm should be put to these important operations. [See remarks under last month.]

Turnips.—The plants in many of the fields sown last month will now be ready for thinning and singling.

Forage Crops.—On spare plots summer rape and white mustard may be sown for a supply of cattle food in the autumn. Rape is a special favourite with milch cows, and greatly increases the flow of milk.

Haymaking.—In the majority of districts this is the great farming feature of the month, "Make hay while the sun shines." This proverb conveys much literal as well as suggestive truth to the farmer at this period of the year.

Cattle.—Summer soiled cattle should have a mixture of oleaginous cakes, or of oil-cake alone, given to them; nor will those in pasture be the worse for this as the period for their going to the shambles approaches. If pastures are very poor, the cattle which are intended for winter feeding should receive such supplementary food as will enable them to be kept in that progressively improving condition so much desiderated.

Cows and Calves.—[See remarks under last month.] Shelter during the extreme heat of the day should be procured for milk cows: it will save them much torment from flies, the attacks of which are most virulent at the height of the day. This recommendation applies indeed to all stock which are generally exposed in the fields.

Horses.—See last month.

Sheep.—To keep down the attacks of flies, sheep washes and compositions will now be in demand. Avoid driving the flocks with dogs in the heat of the day; the gathering, dipping, &c., should be done in the cool of the morning or of the evening.

Pigs.—See last month.

Miscellaneous.—Clean out ditches and outlets to drains; repair fences and walls; prepare compost heaps; keep all tidy about steadings.

AUGUST.

Ploughing—Autumnal Culture.—In favoured districts, where some of the fields have been early cleaned of their crops, towards the latter end of the month every attempt should be made to obtain all the advantages of early cleaned and stirred fields. To obtain this object the grubber and broadshare are most valuable implements, and should be at once brought into use. In the preparation of the *fallows*, the land being by this time well freed from weeds, the manure should be applied. If lime or compost have been used, it will be advisable to harrow them in before finally ploughing.

Turnips.—The best opportunity for cleaning the turnip crop will be afforded this month, and every endeavour should be made to take advantage of it.

Harvesting of the Cereals.—In preparing for this, the grand feature of the year, the realization of all previous labours, the business capabilities of the farmer will be favourably or unfavourably shewn. No time should be lost in seeking for or in preparing all appliances required for field work. The reaping machine, if used, or if not used, the sickles and the scythes, should all be put in the best of working order, so that no time may be lost in the field, when cutting operations have fairly commenced, in making good deficiencies in machines and tools.

Cattle.—See last month.

Cows and Calves.—Regular and abundant supplies of food are required by cows in full milk. To food obtained from the pasture a supply of green cut food should be added, and a little rape-cake or oil-cake after being housed for the night. *Calves.*—See last month.

Horses.—See remarks under the month of June as to shelter at night.

Sheep.—See last month for remarks on dipping.

Pigs.—Feed on grain food, the refuse from kitchen, and the whey, &c., of the dairy. Nursing sows must be supplied with warm and moderately liquid meal mashes.

Miscellaneous.—Remove weeds from the bottoms of fences; fill up gaps in ditto and stone walls; clean out ditches; and cart off the mud, &c., obtained from them to add to the compost heap; take advantage of the absence of stock from feeding-places to clean them thoroughly out; scrape woodwork from all adhering dust, and whitewash walls and ceilings.

SEPTEMBER.

Ploughing and Autumnal Culture.—[See remarks under last month.] In the preparation of large breadths of land for succeeding crops, the steam plough comes into favourable circumstances where it can be economically employed. Lands which have carried the potato crop should at once be put in preparation for the wheat crop. Fallow fields should now be ploughed, preparatory to seeding in the second week of next month.

Wheat Crop.—Where the dibbling of single seeds is adopted, the wheat sowing may be proceeded with.

Turnip Crop.—See remarks under last month.

Cattle.—The decreasing supply of food obtained from the pasture fields, and the gradually decreasing temperature, demand on the part of the stockholder increased care and attention. The food will require to be supplemented by various foods, and shelter will require to be thought of as the nights get cold. See remarks under the succeeding month. The late brakes of green forage will now come in advantageously, if the farmer is fortunate enough to have them; if not, some advanced turnip brake may be available.

Cows.—The supply of food from the pasture being by this time probably limited, it will have to be supplemented by green cut forage or tares, clover, rape, or mustard; a few turnips may also be available, and the giving of cooked food, especially at night, may now be commenced. The housing at night should now be insisted upon. Calves must be carefully looked after, and kept from undue exposure to cold and damp.

Horses.—The condition of horses must be carefully looked to, as they are particularly liable to the attacks of certain diseases at this period of the year. On no account should they be left exposed in the open air all night.

Sheep.—Rams of pure breed should be obtained for the serving of the ewes which are selected for breeding. Sheep nearly fitted for the shambles should be kept up by the addition of a little cake to their food.

Pigs.—Green food may be given to store pigs; meal mashes not too fluid to those preparing for the butcher. Nursing sows should be supplied with fluid mashes, in which whey, milk, and kitchen refuse are used.

Miscellaneous.—Thrash out grain, and get a supply of straw for stacking the new produce; keep the steam-engine and boiler in good order; all the implements and machines used for autumn work to be over-hauled.

OCTOBER.

Ploughing and Autumn Culture.—Should the weather be dry enough to admit of the use of the grubber and the harrow, opportunity should be availed of to carry out autumnal clearing. The effects of this in getting rid of weeds, which would otherwise be abundant, are most strikingly beneficial; and it is in view of the rapid and efficient way in which the operations necessary can be carried out, that the steam plough is so valuable an adjunct to the farmer.

Drainage.—The time is now very favourable for drainage operations being carried on in fields which are cleared of their corn crops.

Root Crops.—The taking-up and storing of root crops now demand the best cares of the farmer. [For full details of the modes of carrying out these operations most economically, see the *Farmer.*]

Wheat Crop.—The getting-in of this—the most important of all the cereal or grain crops of the farm—constitutes the principal feature of field work during the present and the next months. Mr D. Clarke's wheat protector has been used by many first-class agriculturists, and is recommended as a certain preventive of smut in wheat.

Beans and Tares.—Winter beans may be sown this month. The mode of culture is precisely the same as that pursued in other months for the spring beans. Tares and rye may also be sown with advantage, to yield a spring crop of cattle food.

The Housing, Feeding, and General Management of the Live Stock of the farm during the trying months of winter begins this month to engross the cares of the prudent farmer. Recent chemical and physiological investigation have made the fact abundantly clear that the old-fashioned mode of keeping live stock exposed to the inclemency of the weather during the winter months, and of half-feeding them on supplies, too often stinted, of straw and turnips, is as inhumane as, from a business point of view, it is unwise. Great attention is now being paid to the scientific principles upon which depend the great truths of which all advanced farmers are now fully aware—namely, that the greatest economy in the consumption of food, and the quickest results in the fattening of the animals which consume it, are obtained by providing them with proper *shelter*, and a judicious combination of various feeding materials. As regards the first of these essentials, it is truly pitiable to see the profound ignorance with which it is treated by too many owners of stock in this country. Apart from the fact, that while exposed to the inclemency of our proverbially severe and changeable winter in open fields or exposed farm yards, a large amount of the food which they consume goes merely to keep up the supply of animal heat which would otherwise go to the formation of fat, and which is therefore just so much meat and money thrown away; it ought not to be beneath the notice of the enlightened and Christian farmer, that the poor animals thus exposed are subjected to no small bodily pain and torture. There is, indeed, no fallacy in farming so productive of loss of profit to the stock-farmer, and of pain to the animals demanding his care, as that which maintains that all the animals of the farm are of hardy habits, and capable of standing any amount of exposure and deficiency of food. The very contrary is the case: all of them—especially true is this of the horse and the cow—possess a remarkably delicate organization, keenly alive to bodily pain, and even nervous—we cannot say mental—disturbance, and are consequently liable to many diseases which are as sudden in their attacks as they are difficult to be remedied. Knowing what we do of the physical organization of our domestic animals, of the advantages arising by attending to what this knowledge dictates, and of the loss, on the other hand, of neglecting them, we feel that we cannot urge too much the importance of duly providing for the stock of the farm ample and comfortable shelter for the winter months; nor could a little be said here on the humanity involved in this. Not seldom are we pained in our winter inspection of farms to see the suffering of the noble horse or of the patient ox exposed to the biting blast of winter, and forced to pick up the scantiest of livings from the frozen fields. In connexion with the case of the animals of the farm, there are some exceedingly interesting points involved.

Cows and Calves.—The patience, careful attention, and general good management of the dairy will be much more severely tested during the winter months to follow October, than they have been during the summer and autumn months which have just passed. The low temperature, and the frequent and considerable changes in the condition of the atmosphere; the kind of food upon which the cows are in some cases compelled to be kept; the peculiar changes in their milk-producing capabilities which arise often in a most puzzling variety, and the flavour which the milk very frequently obtains from the food used, all tend to keep alive the vigilant care of the dairymaid during the winter months. If cleanliness was insisted upon during the practice of summer, it could not be insisted upon as more essential than it now is. Cleanliness of every part of the dairy and of every utensil in it is absolutely required. We have no hesitation in saying that, in the great majority of instances, where bad colour or taste of butter is met with, they mainly arise from want of cleanliness in utensils used. Thus, the condition in which we have too often seen the vessels in which the milk or cream was stored up—to sour for butter-making—was sure to affect the taste of the butter. Thus, in stirring the cream from time to time, it is frequently so carelessly done as to cause it to start up and adhere in spots on an irregular margin on the sides of the vessel. Now, if these spots on this attached margin of cream are not carefully wiped off by means of a clean damp cloth, they will become rancid or bitter, and will taint the cream in the body of the vessel. The same will happen if the spoon or other implement used to stir the cream is used time after time without being washed. In short, the grand secret of successful butter-making is to have in everything and everywhere the most scrupulous cleanliness.

Horses.—The work of the farm being now generally severe and continuous, it is all the more necessary that the condition of the horses should be conscientiously and carefully looked after. Drinking of cold water after work should not be permitted, nor the entrance of the horses into ponds. They are at this season peculiarly liable to the attacks of dangerous diseases; all sudden chills, such as those which would result from the above, or from exposure to night air, or cold winds, or drenching rains, must be avoided. The food should be abundant and nutritious, and given at regular and not lengthened intervals. Green food, if attainable, should not now be given; if a use is wanted for it, give it to the pigs, which will greedily devour it. The nursing of colts should be judiciously proceeded with. [For a note on the value of gentle treatment, and on the absurdity of cruelty, even in a pecuniary sense, see remarks made under April.] Foals may now be weaned; and when weaned, or during the process of weaning, allow them one full feed of oats daily, but divided into two portions, one given in the morning, the other in the evening. If the weather is open, they may be turned out into a pasture, but only during the day.

Sheep.—The sheep folded on turnips should be supplied with hay, and those preparing for the butcher with 1 lb. of oilcake daily. Lambs for winter and spring fattening, if out at pasture or stubble, should have a little cake, hay, and turnips given to them. Ewes for the early lambing should be out in good pastures. Sheep, for the killing of parasites, should be all carefully dipped or cleaned.

Pigs.—Those for the butcher must be finished off with abundant supplies of fattening food—mashes of meal, oats, or Indian corn. Nursing sows to be kept warm, and fed with moderately liquid mashes. Store pigs to have a supply of dairy and kitchen refuse, with meal, &c.

Miscellaneous.—Cart manure to autumn-cultivated fields; apply artificial manures when necessary; repair farm walls and gates, fences, &c.

NOVEMBER.

Ploughing.—The working of the stubble fields for succeeding and spring crops may now be proceeded with on every opportunity offered. This should not, however, be done unless the weather is good: to attempt to work land, especially that of a close, adhesive nature, in a thoroughly wet condition, is worse than useless.

Drainage.—A vigorous effort should be made to get all drainage operations finished before the severe frosts set in.

Wheat Crop.—Continue to sow fields not finished last month, and take in hand those which still remain to be done. If the weather is good, but an early rain likely to succeed, ploughing, seeding, and harrowing-in may be proceeded with consecutively—that is, if the state of the soil is good, which it should be; for no advantage is obtained in sowing where the soil is in bad condition.

Turnips.—The white and yellow turnips should be got up and stored as early in the month as possible. Indeed, for the white variety, this in many districts will be late enough, as frosts very rapidly attack and deteriorate the value of the roots.

Cattle.—See remarks under last month for general management.

Cows and Calves.—[For general management of the cows, see remarks under last month.] The calves should be maintained in a regularly improving condition. If turned out to pasture—which should *not* be done in cold, damp, windy weather—they should have a supply of dryish food given to them before being turned out.

Horses—As the work of horses may now be considerably reduced, it will be necessary to reduce correspondingly their supply of food. A too full diet at this period is apt to induce diseases; but, at the same time, the farmer is not to have the idea that a starving system is to be adopted with any advantage. A horse is not worth much if let down in condition, and it is by no means an easily done or a cheap thing to get him up into it after he has been let down. Cut fodder should be given, and every attention paid to the supply of water.

Sheep.—See last month.

Pigs.—Clean litter and abundance of it should be supplied. Warm and moderately liquid food to be supplied to the nursing sows. Kitchen and dairy refuse, and distillers' dregs, &c., to be supplied to the store pigs. Fattening pigs to have mashes of meal, with potatoes, turnips, or mangolds.

Miscellaneous.—Repair and weed out fences; clean out ditches; and carry weeds and mud to compost heaps, which prepare and form; cart manures to fields intended for potatoes; thrash out grain for market; make up books and accounts; clean out the courses of irrigated meadows, and prepare to let the water on as early in the month as possible.

DECEMBER.

Ploughing and Draining.—The ploughing of stubble land should be no longer delayed, if the weather and soil are in good condition. The ploughing of lea land should also be proceeded with. Drainage operations should now be pushed forward to completion.

Wheat Crop.—Should the weather and circumstances of soil in previous months have been such as to prevent the wheat sowing being proceeded with, no time should now be lost in making up for the delay.

Cattle.—The great aim of the feeder this month is to keep the stock free from the effects of exposure to cold wet weather and sudden changes of temperature. Box, hammel, and stall feeding have all their advocates. Good and regular feeding to be carefully attended to. [See last month.]

Cows and Calves.—The cows in milk to be fed with cooked food, moderately warm and liquid. Rape-cake will be found to add to the supply of milk. Drying cows about to calve to be fed on drier food, and kept within rather than over. If too well fed before calving, there is much danger of milk fever.

Calves.—Feed regularly, and with nutritious food; and above all, prevent all exposure to sudden and long-sustained changes of temperature. It is wretched policy to starve young stock through lack either of food or warmth.

Horses.—See last month.

Sheep.—Hay to be supplied to the sheep folded upon the turnips, and a modicum of oil-cake. Those upon pastures to have hay and cut turnips. Do all to maintain the progressive improvement of the stock. Ewes should be sheltered at night which are to drop their lambs early. Good and abundant supplies of food to be provided.

Pigs.—See last month.

Miscellaneous.—Prepare compost heaps; thrash out grain; keep all tidy throughout the steading; keep farm roads in good order.

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Monthly Kalendar for the Poultry-Yard.

JANUARY.

General and Introductory Remarks on Care of Poultry in Winter.—Being originally from warm countries, heat or rather warmth is indispensable to poultry, both as regards the growth and fattening of birds for the table, and also for the production of eggs. This condition of their prosperity was obtained in the long days of summer without any care on the part of the henwife; but now that the genial weather has gone, and that cold and bitter days and frosty mornings and evenings replace them, the warmth spontaneously obtained in summer must be supplied by other means. Then the animal food which was so plentifully obtained in the fine season, in the shape of worms, flies, and insects of all sorts, cannot now be had, and the want must be made up, if we would have our baskets filled with plump and beautiful eggs. Cleanliness is another condition without which fowls cannot thrive; and for this they have abundant opportunity when roaming at large in the summer heat. Whoever has watched their habits, must have seen how they take advantage of every heap of earth or ashes within their reach, how they scrape and roll themselves about in it, revelling, apparently, in the delight attending that cleansing bath, to which the sure guidance of instinct directs them. And should no dust-heap be near, the smallest spot of earth on the borders of their pen will be noticed, and they may be seen scratching, and scraping, and rolling, until a bath of sufficient size for their purposes is made, in which they perform their toilet with a scrupulous care which might put to shame many an unfeathered biped. The thoughtful henwife, then, will mark the varied circumstances of her charge, and carefully supply their now increased and increasing wants in such a manner as to make the curtailing of their summer privileges as little felt as possible. And first, as to the loss of the warmth of which they are so fond, and which contributes so much to their health and comfort, we would recommend that the deficiency be made up by an additional supply of food of a more nourishing quality, and given moderately warm. In the summer months, when the fowls leave their roosts shortly after dawn, it is usually found convenient to give them dry grain for their first meal: it can be left in their yard the previous evening, unless the henwife happen to be an unusually early riser. But in winter, we would recommend that their first meal be a warm one; it sets them up, and makes them comfortable for the day, and, besides, promotes laying. As they descend later from the roosts in the short days, their food can be prepared without inconvenience to the henwife or her assistants. The mixture we have found to answer best is potatoes boiled very soft, beaten up with sharps (sometimes called thirds or middlings) and any pot liquor or refuse bits of suet and meat which the kitchen may furnish, seasoned with salt. This will be found excellent food; potatoes are unquestionably nourishing, and the fine bran (sharps) is remarkable for its warmth-giving properties. Barley-dust may be substituted for sharps, or what is still better, half barley-dust and half sharps may be used. The raspings of bread, which can be had from the baker at a moderate price—5d. per peck—may be used at times to vary the food. One advantage of the bran (sharps) is, that it makes the mixture friable, a property which soft food should always have; anything glutinous, adhesive, "sticky," we would say, is peculiarly annoying to fowls; to avoid this, make the mixture as dry as possible. By working it into little balls, a proper consistency will be obtained, and by scattering these balls in their yard, a more equal distribution of the food will be made than by merely putting it in their feeding trays. The sand and gravel they pick up along with it promotes digestion. Should the kitchen not produce enough of fat and meat to make up for the worms and insects found in summer, liver may be used instead. A quantity sufficient to serve a dozen fowls for a week may be obtained for a few pence. The water in which it is boiled can be mixed with the morning meal, the liver can be chopped up, and portions of it mixed in the food each alternate day. Some have objected to boiling the liver, on the ground that fowls have not the worms and insects boiled. In view of this, we tried the plan of throwing down a raw lump in the yard, and allowing the fowls to dispose of it as instinct should direct them. We watched them attentively, but found one and all approach the lump hesitatingly, and turning away without offering to peck, as if moved by an undefinable terror and loathing. We tried it also in its boiled state *en masse*, but found a similar result. The same thing also occurred in putting large worms before the fowls, from which we inferred that, small insects being the natural food of fowls, it was advisable to reduce the animal food given them also to a similar size; and to do this conveniently it must be boiled: so boil it we always have done, and found it to answer excellently well. Salt has also been objected to as being poison for fowls: in large quantities it certainly is so, but if used in the manner and quantity as for the table, it will be found beneficial, as will also a little pepper, in the winter months especially. There should also be placed every morning in the yard a supply of green food—a cabbage, or a turnip, or a beet, whatever the garden can supply—in the raw state of course; the fowls will pick out the most delicate pieces; the head of the cabbage is their favourite *bonbon*. They are fond of green meat; it is good for them; not only so, but it is doubtful, we should say, that they can thrive without it. From the earliest hours of chickenhood, up to their latest day, such food should be liberally supplied. And last, not least, *pure and fresh water* must not be forgotten; it must be renewed daily, and given in large quantities. Innumerable diseases flow from the neglect of this indispensable condition of health—a condition so easily and so cheaply obtained that the neglect of it is quite inexcusable. A covered shed under which to place the food and water, to protect it from rain, &c., will be found highly advantageous; it will also serve as a shelter to the fowls from the inclemency of the weather. Towards mid-day the fowls can have a good feed of dry grain; but should economy be studied, a renewal of their morning meal, with the addition of a small quantity of boiled barley, will be found very suitable. Whatever be their mid-day meal it is imperative that they have before roosting a small quantity of dry grain—we prefer oats: the warmth which they give prepares the fowls for the long winter night; and if accustomed to this, should they at any time be forgotten, they will be found waiting in their accustomed place long after roosting hours, as if to remind the forgetful henwife of their empty crops.

Those fowls which are intended for sale should be fed more frequently, and larger quantities of grain should be given to them than to the other fowls. Where speedy fattening is required, the following will be found a good plan:—Put the fowls to be fatted into a quiet place, and feed them three times a-day with rice boiled in skim milk till it is quite soft and swelled out. Give each time just as much as will satisfy them, and as dry as possible. Remove the feeding dish each time. Let it be thoroughly washed, that no sourness may be conveyed to the fowls, as that prevents them fattening. Give them the milk of the rice to drink, or a little clean water. It will be found that this method gives the flesh a whiteness which no other food can give; and when it is considered how short a time is required for fattening, it will be found as economical as any other mode, or even more so. In five or six days the fowls will be sufficiently fat for the table. The coop in which they are confined must be cleaned daily, and no food given for sixteen hours previously to being killed. Of course, the fowls must have gained size and flesh previous to being put up, or the process described above will be of no use; and, to avoid repetition, it may here be stated that the same remark applies to every process of fattening which may be recommended in any future part of this Kalendar, as there is no plan that can be of any use to an ill-fed, ill-grown accumulation of bones and feathers, so to speak. Let the chicken be well cared for from its earliest days, have an abundant supply of food and water during the day, and a warm, well-aired lodging during the night; it will then gain both size and flesh; and when the period of fattening arrives, it will be easily and speedily accomplished. Besides giving attention to food at this period of the year, the henwife must see that the fowl-house be impervious to rain and snow, free from biting draughts, and otherwise warm and comfortable. If placed contiguous to a stable or cow-house, or kitchen fire, the heat thus communicated will be found of great advantage in winter. The dust-bath must not be forgotten, and be placed either in the fowl-house or in a covered place in the yard, as, on account of the frost and rain which may now be expected, we cannot calculate on the fowls being able to find or make baths as in summer; and without this means of cleaning they would soon become covered with the vermin to whose visits, even under the most favourable circumstances, they are at all times subject. A little sulphur sprinkled in their nests, which should be provided with clean straw frequently changed, is a good preventive to this annoyance. The house should be swept *daily*, and the walls and perches occasionally washed with clean water, in which a little lime has been mixed. It is highly desirable that the fowls should have the benefit of the sun whenever it shines. For this purpose, their yard and run should have an exposure to the south or south-east. They take great delight in basking in the sun's rays, if we may so speak, and do not now seek the shade as they did in the hot days of July.

Labours of the Month.—Long ere this time the hens have ceased to lay, but the Cochins and Brahmas should still contribute their share to fill the baskets. Still, with the utmost care and abundant feeding, the supply will be but scanty. There is only one method whereby we can with any certainty reckon on an abundant supply of eggs, a method which seems little known to many poultry keepers, and scarcely mentioned in books for their guidance. This method does not consist in any peculiar mode of treating adult hens, or any *extra* nourishing food; this, so far from making them more prolific, often prevents them laying entirely. We all know the story of the woman who, having a hen which laid her an egg each day, fancied that by extra feeding she would get two. We know that, far from this being the case, her hen became so fat that it ceased laying altogether.

Evidently, then, while generous and moderate feeding may induce the hen to go on a little longer in the manufacture of eggs, overfeeding has a quite contrary effect, and prevents laying entirely. But, to come to the point, the plan to which we refer is—simply to take advantage of the natural laws to which fowls are subject. Now, we know it is their nature to *commence laying at a certain age*, however late the season or rigorous the weather. Cold, and other adverse circumstances, may diminish the number and size of the eggs, but it cannot prevent their laying—lay they must, and lay they will, when the proper season arrives. This season is earlier or later, according to the kind of fowl. Cochins, if hatched at the time most favourable to growth, and if the weather be fine, will commence at five months old—they have been known to do so as early as sixteen weeks old. Dorkings and Spanish hens do not usually begin till seven months old. Now, by having broods so arranged that a succession of pullets may be ready to commence laying when the eggs are wanted, a supply may be provided when the adult hens are taking that repose evidently necessary for their future fruitfulness. We do not say that hens never lay in winter—the Cochins and Brahmas are peculiarly winter layers; the Spanish hen, too, frequently lays all the year round; but we do say, that, notwithstanding all this, they cannot be depended on to do so. The only certain plan is what we have just stated—to rear a sufficient number of pullets which may begin to lay at the time wanted, and continue to lay during the winter months. With this view, it will be well at this early season to give every inducement to the adult hens to brood. This may be done by placing several eggs, or pieces of chalk made so as to imitate them, in the nest, which must have in it plenty of clean straw or hay. The clucking sound indicates the desire even before the hen begins to sit. Should there be any doubt of her sitting, she can be placed on addled eggs on trial. If she keep close to her nest for a day or two, she may then have valuable eggs given to her.

FEBRUARY.

When it is ascertained that the hen is really brooding, let her be put into a quiet, dry, warm place; put her nest on the ground, make it just the size that the hen can fill, nearly flat at bottom, and sufficiently wide for the eggs to be placed side by side without leaning on each other, otherwise the hen is apt to break them in the process of turning. Place a damp turf in the bottom, line it thickly with clean dry straw cut in pieces. The advantage of the damp turf is, that it prevents the feverish heat which a thoroughly dry nest induces, and which weakens the chicks so much as frequently to render them unable to leave the shell; and we know that when a hen sits herself, it is always in a hedge or about the roots of trees where the damp grass is the foundation of her nest. How strong and healthy such broods are we all know; so if we would have nature's success, we must imitate her procedure as far as we can. When turf could not be had, we have found damp sandy earth answer very well. Breaking the straw in pieces prevents the chipping of the eggs during incubation, and is also much safer for the chickens than the long straws which are apt to get entangled in the feet, wings, and neck, and not unfrequently cause their death. Sitting boxes of wood have been said to be uniformly too warm, close, and dry, to produce healthy chickens, and wickerwork baskets with wooden divisions have been recommended. We have no doubt such baskets are excellent when they can be had, but, for our own part, we have tried every way, and find nothing better than a nest literally on the ground, and put into shape by means of a few large stones, pieces of wood, or anything that comes to hand. With a knowledge of the principles on which to work, a very little ingenuity will make simple materials go a great way. As we before said, the hen must be put into a quiet place; she does not like noise while hatching, and if disturbed is apt to leave her eggs, or to break them by the sudden movements which terror causes. When any of the eggs are broken the shell should be removed, and the others carefully wiped with a damp cloth; if the egg is left on the shell, when dry it forms such a thick coating that the chick cannot penetrate it, and so perishes in its dismal prison. Hens have been accused of eating their eggs; the probability is that they only do so when the eggs are broken, hence the necessity for taking care and endeavouring to keep them entire. If there is a house specially devoted to sitting, the hens must be separated and placed at some little distance from each other, that they may not steal the eggs which do not belong to them; this they are sure to do if close to each other. We have seen one covetous hen appropriate to herself nearly double her own share: how she conveyed them all in safety was marvellous, but certainly she did so; how, we have never been able to discover. Had she not speedily been deprived of her ill-gotten gains, she would, in all probability, have failed in bringing out a single chicken. After the hens are fed, it is well to see that each resumes its own nest, as they often covet those of their neighbour. The larger, the whiter, the more numerous the eggs, the more does the hen desire that nest, whether it belongs to her or no: hence the necessity for care and watchfulness. Where fowls are kept on a large scale, a sitting-house is as indispensable as a hen-house; but where only a few are kept, and accommodation is deficient, ingenuity must supply the defect. Any out-house that can be spared may be made use of; an unoccupied pig-stye, a barrel laid on its side, and well filled with the materials we have mentioned—any or all of these may do, provided always that the occupants be sheltered from wind and rain, and protected from the intrusion of their enemies, whether bipeds or quadrupeds. We have even seen a hen set in a "press" or cupboard by the side of a kitchen fire: the sagacious creature scratched the door when she wanted food. The warmth of this position contributed to bring out large and early broods.

Wherever the hen is set she must have food once a day, and a copious supply of clean fresh water; she must also have access to a heap of earth, sand, or small gravel, to dust her feathers. She must not be off her nest more than half-an-hour; generally she returns to it spontaneously, but should this not be the case, she must be gently driven on. Soft food, such as has been described above, has been recommended; and we have no doubt it is excellent, provided dry grain be given in addition. Oats we have always found to be the greatest favourite with our hens, and upon this alone we have frequently fed our sitting hens, and found it suit.

MARCH.

This is an excellent month for setting hens. Those brooding will be more numerous than they were last month, so that the henwife will not now be compelled to take the first she can get, but make her choice: a steady, well-feathered, short-legged, plump hen will doubtless be selected; and if she has already fulfilled well the duties of maternity, so much the better, Dorkings she will probably prefer; they sit early, and remain long with their chickens. The kind of eggs set will depend on what pullets are required. If Cochins are set, they will lay early in September, and continue to lay all winter; Dorkings and Spanish in November. The eggs, of whatever kind, must be fresh—not more than a fortnight old. They should be kept in bran in a warm place, with the pointed end undermost. Before setting them, it will be necessary to examine them, by holding them between the eye and the sun, or a lighted candle or gas, having the broad end of the egg encircled by the lower part of the hand. If the egg is clear throughout, it is unproductive; if the air-bag crown is distinctly visible, it is fit for setting. Sometimes the crown is on the top of the egg. In this case, it is said the egg will produce a cock chicken; sometimes the crown is at the side, and then it will produce a hen chicken; but for the truth of this theory the writer cannot vouch, not having yet tested it. The number of eggs set will depend upon the size of the hen or the season of the year. In March or April, a good-sized hen may cover twelve or thirteen eggs. In January and February, when the frost and snow may be expected, the number may be considerably reduced: warmth being indispensable to the growth of chickens, it is important that the hen should have no more than she can cover properly. When the brood is too large, the outside chickens get chilled. They squeeze themselves in, and force out others, which in their turn get chilled, till the whole in succession suffer, and, in consequence, they either droop and die, or grow up dwarfish and stunted things. And it must be kept in mind that very early chickens attain a considerable size before the setting-in of genial weather. Allowance must be made for this, in calculating the number which the hen can cover, for it is better to have a moderate-sized brood, and rear every one, than see them in succession droop and die, which they are sure to do if not thoroughly protected by the mother hen during the long cold nights of early spring. When *turkeys* are kept on a large scale, they are not set until the whole flock have ceased to lay, as it is of consequence that all should be hatched together—the practice being to entrust two broods to one hen. The turkey hen is such an assiduous sitter that she would not of her own accord leave the nest during the whole time of incubation. It becomes necessary, therefore, to remove her daily, for the purpose of feeding her, otherwise she would either starve in the nest or lack the warmth necessary to bring out a brood. On the 26th day the eggs must be examined, the addled ones removed, the hens well fed, and not disturbed again till the poults are hatched and dried, which will be, the former about the 27th or 28th day, the latter, 24 hours after leaving the shell. During that time they require nothing but the mother's warmth. If exposed to cold before being thoroughly dried, they will undoubtedly perish. The turkey hen may have fifteen of her own eggs; if set on hens' eggs, she will cover twenty or upwards. The cock must be kept at a distance, otherwise he will be sure to kill the poults.

APRIL.

By the end of the 21st day, or the morning of the 22d, the chicks, if strong, will have left the shell; the weak ones may be a few hours longer. Sometimes it is necessary to chip one side of the egg a little, in order to assist the chick to leave its prison. Dorkings especially often require this, the shell usually being so thick; but, as a general rule, the less they are interfered with the better. The shells and addled eggs should be removed, the hen fed, and the chickens left undisturbed for 24 hours. At the end of that time they may be fed with oatmeal moistened with a little milk or water, not too wet, but of a friable consistency. Pure water must also be set before them. To prevent them from wetting their feathers, and also to obviate any danger of drowning, which not unfrequently happens, the water may be put in a saucer half-filled with small stones. The scale on the extremity of their bill may be removed with the finger nail, to enable them to pick up their food without encumbrance: some green food should also be given. If convenient, the hen and chickens may be placed under a coop in a warm dry place, and food and water placed outside, but so that the hen may have access to them. The coop must be cleaned daily. The chickens must be fed very often, and at all times have both food and water within their reach. They are very fond of buttermilk, and it contributes very much to their growth, but it must be given in addition to water, and not instead of it. Their last meal should be at nightfall. They will rush from under the wing at the approach of the henwife, though it should be ten at night, and pick up their crumbs as briskly as if it were ten in the morning. They are also very early astir; it is no unusual thing for them to be looking out for something at four in the morning. To meet this want, it will be found highly advantageous to lay down their provision at night; and should there be light in their cellar, as there ought always to be, they will be scraping and picking at peep of day. It is of great importance that the chicken-house should open to the east, that the chickens may have the benefit of the rising sun. But we are anticipating, and must return again to the first days of chickenhood. To the oatmeal, which was the first food, may be added, about the third day, an egg hard boiled and minced down, mixed with bread crumbs. In a week tailings of wheat may be given, or even ordinary grain; the hen will break it for the chicks, and even feed them. It is essential that the same individual feed and attend to them: they will be frightened by the appearance of a stranger. The mother hen is constantly on the watch for the enemies of her family, and ready to do battle in their defence. For this reason the henwife requires to be on her guard, and to handle the chicks as little as possible; for the hen, in defending her progeny from fancied danger, is apt to inflict upon them real and even fatal injury.

MAY.

When the chickens are a week old, it will be found highly beneficial to allow them to go abroad for an hour or two in the heat of the day with the mother hen, should the weather be favourable; but wind and rain at this early period would be very injurious, perhaps fatal to them. When there is no grass run, they can with safety be admitted into the garden; the little injury chickens do there is amply compensated by the good they accomplish by picking up grubs, worms, insects, &c. We cannot say so much for the mother hen, for she will not hesitate to make her dust-bath in the very finest flower-beds, making sad havoc among them. To prevent this, she can be put under a coop, food and water outside, and the chickens, however far they may wander, will return to her.

Should there be a number of broods, care should be taken to keep the hens separate, or they will be sure to fight, and in their combats may not only injure each other, but even kill the poor little chickens which flock around them. Their love for their own progeny, too, is so exclusive, that they cannot bear to see that of a neighbour hen have any enjoyment, but are sure to ill-use and peck at the strange chicks, and prevent them feeding when they have an opportunity. To prevent this, each hen may have her own coop until they have been accustomed to each other, when, should there be convenience for it, each hen may walk forth into the grass run with her own chickens, happy when they are feeding around her, and secure that, when they wander, her call will be distinguished from every other, and will bring them back with unerring certainty to her sheltering wing. This is, indeed, a season of peculiar happiness to the henwife who really and heartily enters into her work. Now she reaps the fruit of her labours in seeing around her numerous and thriving broods; and many a languid and listless seeker after pleasure might envy the delight with which she anticipates their wants and ministers to their necessities. Months of care and labour are indeed before her, but the labour is so sweet that she is almost sorry when it comes to a close.

When the chickens have been accustomed to a coop, they will return to it spontaneously, and will not easily be induced to move from their quarters. To avoid changing them from place to place, than which nothing can be worse, it will be necessary to cover the coop at night with tarpaulin, to shelter the inmates from the wind and rain, and also to defend them from the attacks of rats and other vermin. We remember well the difficulty we had in taking the hen and her chickens night after night from the coop in which they spent the day to the chicken-house destined for their night quarters. We remember how they ran here and there and everywhere—how wearied and drooping and fagged they were when they reached their destination. Experience, that peerless teacher, taught us that it was better to keep them in their accustomed coop, with worse accommodation, than to subject them to such fatigue and terror, in order to obtain what *seemed* to be better.

It may here be mentioned that, should any of the sitting hens fail in bringing out a respectably-sized brood, two broods may be put together. Should the hen shew any repugnance to the strange chickens, they can be put under her wing at night, and before morning she will not know the difference. The bereaved mother must be shut up by herself till she forgets her lost ones, which she will probably do in a few days.

JUNE.

Early-hatched chickens will now be ready for market. Previous to being sent off they can be put into coops and fattened by means of one or other of the plans detailed above, the best having previously been selected for keeping up the breed. Feed all kinds of poultry on a variety of food; the more it can be varied the better. As the housekeeper who puts on her table, day after day, the same viands, be they ever so good, will soon find the appetites of her household to flag, so will the henwife find her poultry droop if she presents to them the same unvarying mess. Variety must, therefore, be studied. Oats, barley, wheat, rice, may all be given in turn. Buckwheat is much used in France for fattening fowls. Sunflower seeds are also freely eaten by poultry, and are said to fatten quickly. Grain can be given dry and boiled alternately, except oats, which must always be in its raw, dry state. Barley, if used freely raw, will be sure to injure the fowls by swelling out in their crops; it is, therefore, always the safest plan to have it previously boiled, when it will be found an economical food. Wheat is also rendered more economical by boiling, and is a favourite with fowls. Rice must be boiled very soft, and allowed to cool in the water, when it will be found to swell out to a great extent. Indian meal is also a very nourishing food. Peas and beans have also been much recommended, but we have never found either the one or other a favourite with poultry. Should there be any dairy refuse, in the shape of skim, sour, or curdled milk, it will be found suitable for poultry of all ages, especially for the *young* of all kinds of domesticated fowls. Parsley, cabbage leaves, lettuce leaves, &c., may be cut into small bits and given to chickens mixed with their food: they will be found to pick out the green food and to eat it greedily. The turkey poults have by this time emerged from their shelly prison, and will now require care—an extra amount indeed, as they are so delicate and difficult to rear. They are commonly fed for the first week on hard-boiled egg, chopped and mixed with bread crumbs, and a little pepper, with milk or water to drink. After the first week, they get, in addition, minced onions, boiled peas, curds, oatmeal moistened in water, and then grain, like the larger fowls. We have seen large and beautiful flocks raised by merely giving the oatmeal, *unboiled*, moistened with water, chopped lettuce or cresses, or nettles mixed with it, along with a little pepper. Abundance of clean water provided, but in addition, a daily allowance of new milk also allowed. A little egg, or liver, or curd occasionally; but the milk must be continued for two or three months. They must be carefully protected from wind and rain, and sheltered from the scorching rays of the sun. The turkey hen is a most devoted mother; she will hatch the eggs of the hen, and bestow the same attention on the chickens as she would on her own poults. As may be imagined, she is equally vicious to strange broods. Woe be to the poor little thing which attempts to join her favoured family; we have even seen her actually kill her *very* own poult (hatched by a hen) when we attempted to add it to her brood, so thoroughly fierce is she when entrusted with the care of the young, whether her own or those of the hen. At other times she is gentle, and her elegant appearance makes her a great ornament to a poultry-yard.

It must here be stated, that when the chickens are about three months old, the sexes must be separated.

JULY.

The adult fowls which have not been engaged in the duties of maternity have, no doubt, been for many months contributing to the contents of the egg baskets, thus making eggs plentiful and cheap. In anticipation of a scarce and dear time arriving, the thrifty housekeeper may now adopt one or other of the *many ways of preserving them.* The simplest plan is to smear the shell slightly with good fresh butter, and place the eggs in a jar with the narrow end undermost; they will keep for months by this process, and retain at the end of that time the delicious milkiness peculiar to a new-laid egg. It ought to be done as soon as possible after the egg is laid. It is rather surprising that a plan so efficacious is not universally adopted. It need scarcely be added, that eggs after being buttered will not do for setting. Another way of preserving is by putting the eggs in ashes or sawdust: they must be entirely covered so as to exclude the air; the narrow end, as in the previous plan, placed undermost. The following is an excellent recipe for preserving eggs in lime-water, extracted from Mrs Fergusson Blair's popular and interesting work, the "Henwife."

"Select only perfectly formed eggs; the slightest fracture or imperfection in the shell would cause the failure of the whole batch. Place the eggs carefully in a jar, and pour on them lime water, which is made by dissolving quicklime, in the proportion of two shells to 4 gallons of water; this must stand a day at least, till the residue has settled at the bottom of the vessel; the clearer portion is then poured over the eggs, so as to cover them.

"Should the jar not be full, fresh eggs are added from time to time, and as the lime-water rises, it is poured into another jar ready to be filled in like manner.

"Be careful that the eggs are at least one inch below the surface of the water; place a plate or lid of wood over to prevent them floating; tie up the jar and label it, stating the date and number of dozens."

The henwife must see that the eggs are removed at once from the nest, as they are apt to be addled by the hens sitting on them. Care must also be taken in bringing them from the henhouse to keep them dry, as a single drop of water may taint the egg. They should be disposed of as soon as collected, for they change rapidly during hot and moist weather.

AUGUST.

If the hatching season has been good, and the coops unthinned by disease, the henwife will find it no easy matter to supply corn to fill the crops of the pullets and cockerels, which, as chickens, were so easily satisfied; she will, therefore, be easily persuaded to send to market without delay those which are not required for keeping up the stock. Previous to this, however, she will select from her numerous families those which she means to grace her own pen. Her choice will doubtless fall on healthy, handsome, full-bodied, sprightly hens, whatever be the breed she may fancy. Taste varies in this as in other things. The high esteem in which Cochins were at one time held has been found so utterly ridiculous, that a reaction took place and sunk them far below their proper level. From this, however, they are beginning to rise, and a short time, doubtless, will place them in their true position. When one kind of fowl only is kept, better than Cochins could not be had, especially if the accommodation is limited; for they thrive in a small place; do not wander, are too heavy to fly over enclosures, lay far on in the season, and fatten easily for the table: any want of delicacy in their flesh is compensated by the additional quantity supplied. The frequent desire of the hen for incubation is her great fault; in order to remove this desire when she is not wanted to sit, put her into a dark cellar without any nest, and keep her on low diet three or four days; at the end of that time she may be returned to the yard, and in a week or so she will recommence laying. Should the cure not be effectual at first, repeat it until it is so.

When the principal object in keeping fowls is to have a supply of fine eggs, the Spanish hen is to be preferred before the others. Her eggs are very large, and she produces them in great numbers also, for she wastes no time in brooding, seldom shewing any desire to sit. The chickens are very delicate, and difficult to rear; the hens are hard moulters, and bad foragers. By crossing them with the Dorking, a kind is produced which, for laying and breeding, cannot be surpassed; and which, for the table, may challenge anything that can be produced. Pure Dorkings are highly esteemed by fowl fanciers. The great weight to which they attain makes them valuable for the table; they are good foragers, good layers, and good mothers, but their eggs are in general smaller than those of the Spanish hen; and where the accommodation is limited, they are very unsuitable, for they are great rovers, and require a fence of great height to keep them within bounds.

Whatever be the kind, breeding in-and-in, as it is called, must be avoided; the very best breed will soon degenerate by this means. To avoid this, the cock should be procured from a totally different strain; he should be in his second year, and changed every two years. He should be lively and sprightly, the best of his kind that can be had. In introducing a new one, he should be quietly and stealthily placed on the baulks after dusk. If introduced in full daylight, the hens might attack him in a body, and injure or even kill him. Should two be brought into the yard at once, they would be sure to fight, and the hens will be found to take to the victor, and unanimously discard his vanquished foe. It is wonderful to see how a good cock will forage for his hens; how he will "luck luck" to them when he discovers any treasure. We remember how a noble chanticleer of ours once on a time refused to share the corn on which his mates were feeding; how he kept restlessly moving about, looking all the while as if he missed some one; how he turned out of the yard into his run, and presently returned with his favourite hen; and how they then enjoyed together their grains of barley, better to them than grains of gold.

As to the number required, one cock to six or eight hens is the number usually allowed, if the eggs are to be set; if not, one might do for a yard of fifteen or twenty hens.

SEPTEMBER.

The henwife may continue to dispose of eggs as soon as gathered. They change rapidly during summer and autumn, and so are liable to deteriorate in value more than during spring. She may also continue to add to her store of preserved eggs, whether buttered or preserved in lime-water. Some of the latter broods will now be ready for market or table. Cockerels, unless destined for roosters, should be killed off as soon as they have sufficient flesh. All they eat after this is simply so much food wasted. The pullets not suited for mothers or for layers should also meet with similar treatment, and the yard thus be gradually reduced before the setting-in of winter. If the remainder be turned out into the stubble, as in farm places they are almost sure to be, they will feed sumptuously, and greatly add to the contents of the egg basket. In kitchen-gardens, too, when the potatoes are taken up, and much of the green crop consumed, poultry will be found to do little or no harm; the worms and insects they find contribute much to their egg-producing powers; the droppings give fertility to the soil, and almost compensate any injury they may do. The fresh air sets them up wonderfully, and prepares them for the confinement of winter.

By this time the henwife will have a stock of feathers collected, and if she has acted prudently they will be nearly all ready for use. The plan is simple. Let each fowl be plucked while warm; separate the large wing feathers, put the others into a dry tub, or basket, or box, in a dry place; shake them up each day, so that all may alternately be exposed to the air; then put them into paper bags, put the bags into a *coolish* oven, let them remain till thoroughly dry, when they will be fit for use—or the bags may be suspended from the roof of the kitchen, but in this case they will take longer to dry. Some of the small feathers require to have the hard quilly portion cut off with a pair of scissors. The wing feathers may be stripped and added to the others.

We have hitherto made no mention of the diseases to which fowls are subject, and of the remedies for them, for two reasons: first, we think that the henwife who scrupulously attends to the conditions of health on which we have enlarged, viz., warmth, cleanliness, proper feeding, and proper cleaning, will have little reason to complain of disease in her poultry-yard. Secondly, when disease does make its appearance, we have little faith in the remedies propounded for its removal, having rarely seen them produce any good effect. We would seek, then, by steady adherence to the plans laid down, rather to prevent disease than to cure it. But should the fowls at any time shew symptoms of illness, hanging the wing, or delaying to leave the henhouse, good might be done by at once mixing in their food some simple medicine, such as Epsom salts or jalap, in the proportion of a teaspoonful to twenty fowls. Some give this occasionally to all their poultry, and find it do them good. The warmth of a fire, or even of the hand, often restores a chicken when apparently dead. And whatever be the treatment in case of disease, the patient must be removed from the yard; for, strange to say, the other fowls invariably ill-use those which are ill, and not unfrequently peck them to death.

Disease in the feet is often caused by the fowls descending from high perches. Though they ascend by means of a ladder, yet they *never* use it in their descent; hence the necessity of having the perches placed near the ground. The feet of young turkeys are injured by treading on nettles.

It may be supposed that something should be said about the quantity as well as the quality of food required for a given number of fowls. This might easily have been done, but we imagine that it would be productive of no good results. A very little experience will shew the attentive henwife the quantity requisite. Should she at first err, as it is likely she will, on the side of profusion, the wasted food will disclose her error, and lead her to give in future more stinted supplies. Should the opposite error be made, the mistake will be even more readily discovered. Her feathered dependents will have no difficulty in conveying to her a sense of their wants; nor will their eager look be misunderstood or neglected by the faithful henwife, whose happiness it ever is to anticipate the wants and minister to the necessities of her confiding flock.

OCTOBER.

The labours of the henwife have by this time narrowed down to a comparative small compass. The hatching season is over—the spring broods have arrived at maturity—the spare birds, pullets, and cockerels, have been despatched to market or consumed at table, as the case may be—the latter broods have passed the dangers of chickenhood, and are beginning to feed with the larger fowls. The sole duty of the henwife now is to attend to those which remain, whether they are to be fattened for Christmas festivities, reserved for winter layers, or destined for future mothers. But she must not suppose that her labours are over: troubles we will not call them, for this is a word that enters not into the vocabulary of the lover of the feathered tribe. No! far from being troubles, none but those who have experienced it can conceive the pleasure attending the performance of these varied and delightful duties, that, for example, for selecting a faithful and tried mother hen—of watching her day by day as she fulfils patiently her apparently wearisome task of waiting for the first appearance of a chick—of counting them one by one as they emerge from the shell—and, finally, of seeing a large healthy brood gathering around her, eagerly looking up for the corn and the crumbs she with so much pleasure scatters around them. Verily, such an excitement, so pleasing, so intense, and yet so healthful, throws in the background that to be obtained from the theatre or the card-table, and renders those who delight in it independent of those excitable amusements. Evidently, then, trouble is not a word which the henwife can use in reference to her feathered pets: duties to her are pleasures, and this season of the year does not altogether deprive her of these. It finds, indeed, the objects on which her cares are to be bestowed diminished in number; but then those that remain demand greatly increased attention. For information on all points connected with the supply of food to, and the general care of, poultry in the cold months of winter, now rapidly approaching, the reader is referred to the general and introductory remarks which precede the practical labours of the month of January.

NOVEMBER.

Should the henhouse be heated by flues, care must be taken to keep the temperature as nearly uniform as possible. Let biting draughts of wintry air be excluded, let the roof be perfectly water-tight, so that no dripping rain be allowed to enter: few things are more injurious to fowls than damp. When the henhouse is not heated by artificial means, it is well that the fowls, which in summer have been distributed into different houses, should now be put into one: the heat they communicate to one another enables them the better to resist the winter's cold. It is miserable to see a mere sprinkling of fowls on the perches in winter; but a well-filled henhouse gives an idea of warmth and comfort, even in the severest weather. The henhouse must be well aired every day, thoroughly swept also, and then sprinkled over with sand or ashes or fine gravel. Sand has been objected to on the ground that it encourages the growth of fleas, an enemy against which the henwife has always to be on her guard, and in place of it sawdust has been recommended as being more conducive to cleanliness. This may be correct; sawdust has undoubtedly many good properties, but we have always used sand, and never saw any reason to think it harboured vermin, as our fowls were remarkably free from that pest of their existence. Besides rendering the floor more easily cleaned, it is useful for other purposes; the small stones found in it are picked up by the fowls and assist greatly in the digestion of their food; and if, besides being sprinkled on the floor, it be also put in a heap in a corner of the henhouse, it will serve to clean their feathers, and remove any vermin that may attach to them. In passing, however, we may say, that wherever the dust-bath be placed, and whether of sand, or ashes, or earth, it must be regularly changed, at least once a-week, on the same principle that induces one to take clean water for the purposes of ablution. The henwife must not repine at her baskets being now comparatively empty, as they probably will be. To induce her common hens to lay a few weeks more, she may continue to feed them with warm food, as previously directed, and she must not forget to place within their reach a quantity of limy rubbish, such as old mortar. The hen requires this for the formation of shells, and if this material be not supplied, she cannot produce perfect eggs. Should there be a deficiency of lime, oyster-shells can be procured, burned in the fire, then powdered down, or even broke into small pieces. The hen manages wonderfully to break them down for herself. The limy rubbish may advantageously be scattered all about their yard, and it *should* be mixed in their dust-bath; for when performing their dry ablutions, if we may be allowed the expression, they are also busily employed in laying material for the production of eggs—their outer covering at least.

At this season it will be advisable to confine turkeys in coops, as they will not fatten if allowed to roam at large. They may have the same food as the hens, with the addition of curdled milk.

In anticipation of the hatching season, and in order to secure the breed of chickens that may be wanted, it will be found the safest plan to remove all the cocks except those from which you mean to breed.

DECEMBER.

This being the season when poultry is most in demand, the prudent henwife will see that her remaining cockerels and pullets, of both spring and autumn broods, are in good condition for the table. In order that they may be so, she will resort to whatever mode of fattening commends itself to her judgment, or which past experience may point out as the best. Whatever be the plan adopted, the fowls must be put into a dry, warm place, with very little room, as moving about prevents fattening. During the intervals of feeding, they must be kept in the dark. On no account must they be retained in the feeding trough more than a fortnight; the state of repletion in which they are kept is apt to induce fever if continued longer, and thus to render them unfit for the table. It is obvious from this fact that, although fowls may be fattened to a great degree by penning and cramming, the fat thus acquired is not a wholesome fat, but verges on disease, if it does not indeed amount to it. And it is our opinion that a fowl left at liberty, provided it be supplied with abundance of corn, will be a more general favourite than the swelled-out subject of the cramming system. Opinions, however, differ on this as on other points, and many have a decided preference for these over-fed fowls. We know of one individual who had always treated his poultry in the natural way, if we may use the expression; but who bethought him of trying the much vaunted method of cramming. He penned up his fowl, *stuffed* it *once a-day* with a paste made of barley-meal, suet, coarse sugar, and milk. The paste was forced down its throat till it could literally contain no more. It was then left *in the dark* till next feeding-time. At the end of a fortnight its size was enormous. It was sent without remark to a friend. Next time the friends met, the question was put with a tone of surprise—"What sort of a fowl was it you sent to us?" "Why, was it not good?" asked the other. "Good!" was the reply, "never was anything more delicious, and such a size; it was like cutting into a leg of mutton!"

Another mode of fattening we would recommend is this:—Mix barley-meal with water or skim milk into the consistency of cream; put a little coarse sugar or treacle into the mixture; put it in a shallow dish besides the fowls; do not give them any water—thirst induces them to consume large quantities of the mixture; let them have as much as they want; change or clean the dish three times a-day, to prevent the food getting sour, as sourness prevents fattening. They must have sufficient light to see their food, but the less they can do with the better; put a little sand or gravel in the coop.

Another plan is, to give oatmeal and barley-meal alternately, mixed with milk and a little dripping; let the dish be cleaned as in the previous directions, gravel and sand supplied, and, in this case, abundance of clean water given. Many other details might be given, different plans, or modifications of those already given; but we imagine that these will be sufficient for the observant henwife, who will be able to change or modify the plans proposed according as her judgment may direct, or her circumstances may require.

Cheese and Butter-making: How to meet Foreign Competition.

WE need not to give our readers any statistics as to the continual increased production and importation of the dairy products of America and Canada, for every shop in our towns, and even in some of our agricultural villages, has its supply of American and Canadian cheese. Liverpool, to which port the greatest weight of American produce is brought, has just now its warehouses crowded out with boxes of American cheese, the stock on September 30 being 170,000 boxes. The newspapers shew from day to day the ruling prices, and thus our farmers are able to compare them with those of home produce. Speaking generally (allowing for the difference in the lb. per cwt., foreign cheese being 112 lb., Lancashire 120 lb., Cheshire 121 lb. to cwt.), the wholesale price of American is fully 15s. per cwt. lower than Lancashire. There is, however, one kind of cheese which the American supply does not and cannot interfere with; that one kind is neither affected in price nor in demand; it is the one only kind that is unaffected and that never will be affected. That one kind is the finest quality. This applies to Lancashire, to Cheshire, to Cheddar, and to all other kinds of cheese. In every county, cheese of the finest quality—even now in spite of the flooding of Americans and the fierce competition they exercise—the finest dairies are in good demand and at good prices. But then comes the lamentable fact that in many counties for one dairy that is really fine you have above 100 that are below that standard—including middling to common, and down to bad. This is the case everywhere. We notice in a report of the great annual cheese show at Frome, Somersetshire, that "the lament of the judges this year has been that the fine quality of cheese usually to be found at Frome is absent, and that in place of the pleasing and flattering information that 'the finest cheese in the world was to be seen in the tents at Frome,' the West of England cheese-makers were told that they must 'take greater care in the details of dairy management,' and that 'the worst lot of cheese they had ever judged' was in the cheese tents at Frome this year." The judges further remarked:—"The public would have fine Cheddar cheese, and were willing to pay the price for it; but if they did not make fine cheese, the Americans would swallow them up." This remark fully endorses what we have just said—that for the finest qualities the consumers will willingly pay a high price. Under the head of "Genuine milk at twopence per gallon," we (*Preston Herald*) gave some startling facts respecting Cheshire cheese, and concluded as follows:—"Here is a difference of £49 per ton betwixt cheese skilfully made and cheese spoiled in making. With such illustrations as these, and those of a shade less striking might be given by scores, no wonder the Duke of Westminster should have made cheese-making a theme in his recent speech, and that Joseph Aston should urge the necessity of 'dairy colleges,' or places where persons should secure sufficient skill as to prevent them from making good milk into bad cheese." We like the name of "Dairy Schools" better than the one named, and we had hoped that the British Dairy Farmers' Association would have been able to see its way to starting at least one Dairy School in some part of England, to which young persons could be sent to learn the "art and mystery" of cheese-making, and butter-making also. Some years ago it was anticipated that the introduction of the factory system of cheese-making into England would have led to an improvement all round. It was expected that the factories would all turn out really fine cheese, and that they would be training-schools in which a race of young cheese-makers would be educated and return to their respective farms to produce home-made cheese of really fine quality. The latter important matter, if ever attempted, was in only a few isolated cases. But worse than that, the quality of cheese produced in most of the factories does not now come up to the standard of "fine," and in some of them far below it. The fact is that, though a factory possesses great advantages over a farmhouse in that it is designed specially for cheese-making and cheese-keeping, being fitted up with every convenience, and having everything to facilitate the making of fine cheese, yet something more is needed, and if that is lacking the factory only perpetrates the defects of home-making on a much larger scale. What is needed alike in the factory and at home is skill and experience. Hence we are brought back to the necessity for a Dairy School in which to train persons, and to fit them for dairy work either at home or in the factory. We must not omit to notice that most farmhouses are ill-fitted for making cheese or ripening them, while in factories they have no drawback of that kind. Few owners of farms have ever done their duty to their tenants in regard to fitting farmhouses for cheese-making. We only know of one landlord who has thoroughly carried out what is needed on a dairy farm, and that is Lord Tollemache, on his farms around his lordship's residence at Beeston Çastle, Cheshire. At those farms the tenants have everything that can be desired, or is needed, for making good cheese at home. We think that landowners need to take a lesson from Lord Tollemache, and, by copying his excellent example, relieve their tenants of one very great drawback under which they now labour.

The present position of affairs suggests another matter for discussion. We should like this question to be answered by those competent to do so: Would it not pay better, with medium quality cheese at present prices, to use the milk in producing butter, and use the skim milk either in fattening young animals, or in making skim-milk cheese? Of course, the best-paying plan is to sell the milk for consumption just "as it comes from the cow." We have shewn that rich cheese, bad in flavour and deficient in keeping properties, only returned to the farmer, in that case, little more than twopence per gallon for his milk. But every farmer can calculate what he gets per gallon for his milk if he will remember this fact (ascertained beyond all doubt by hundreds of tests), that, taking the average of the year round, it takes a full gallon to make a pound of the newest cheese. Hence, if a farmer sells his cheese when fit for consumption at 55s. per cwt., he gets about 5¼d. per gallon for his milk. If he sold cheese at that price on the day they were made, he would get 5½d. per gallon, taking an average of the year. Farmers know the wholesale price of milk when sent by rail, and they know the cost of substitutes for the whey; hence they can calculate the profits of milk-selling. But all are not conveniently situate for sending off milk; and, besides, if the market got overstocked with that, it would bring down prices. Now, it suggests itself to us that more might be done in butter-making. And there is this important fact in connexion with our farmers' butter—it always fetches a high price compared with any other butter; indeed, the difference betwixt it and American butter is immensely in our farmers' favour. Recently the very highest priced American butter is quoted at 90s. per cwt., or less than 10d. per lb., while our farmers' butter fetches from 1s. 4d. to 1s. 6d. per lb. Here is a great margin in our favour. The fact is, that while American cheese come in the very strongest possible competition with Lancashire cheese, the competition of American with Lancashire butter is as nothing. Milk-selling and butter-making are evidently the two things in the dairy department to which farmers must turn their attention. Very soon we shall have our butter advancing in price, and hence farmers might profitably stop cheese-making at a much earlier date than they used to do. As late-made cheese are always bad to sell, and fetch low prices, the market would be relieved of all such if farmers went on to butter-making earlier. By ceasing to make cheese earlier in autumn, and beginning later in the spring, a less weight of cheese would be thrown upon the market, and that of itself would often help to keep prices up. In these times, the farmer needs to look even to little things in order to catch benefit wherever he can, and it is with the last-named object that we have ventured to throw out the suggestions in this article. The Americans, even in their large factories, go on the principle we have just named, for whenever they find butter paying better than cheese, they cease making the latter, and go to producing the former. Regarding making skim-milk cheese, we fancy our farmers are fully competent to do so; but we might suggest to make them very moderate in size, and use a liberal quantity of cheese-colouring—fully more than in making well-coloured, whole-milk cheese.

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The Shepherd's Kalendar.

By THOMAS SCOTT, Secretary to the Boroughbridge Agricultural Society.

JANUARY.

THE breeding ewes ought to have a plentiful supply of roots, in order to give them full condition prior to lambing; for, although it is argued by many that with ewes in a fat state a greater loss is sustained from deaths, I am inclined to think quite the opposite, and that ewes when full of flesh, are much more equal to combat difficult cases of parturition than when emaciated and lean, in which latter state they often sink. Fattening-sheep and hoggs are now fed on cut swedes, with more or less artificial food, as they are intended for early maturity or otherwise.

FEBRUARY.

Although it is highly advisable to have ewes full of condition when they lamb, it has been proved that if they are fed on roots exclusively up to that term, the offspring is weak and delicate; it is, therefore, prudent to remove them to grass, and gradually diminish the supply of roots, up to lambing, and substitute, say, a little cake, corn, malt-culms, &c., any of which appear equally to tend to develop the fœtus, and therefore that which is cheapest may be selected.

MARCH.

In a large flock a few cases of abortion generally precede the lambing season which is not much to be feared, as in the ewe, unlike the cow, this casualty is not at all contagious, although the same cause may be productive of several cases which are, such as fright from dogs, jambing, forcing through gateways, &c., all of which ought to be studiously avoided. Rare instances of prolapsus uteri, too, occur, prior to lambing: these cannot be avoided, but a skilful and attentive shepherd, in the majority of cases, delivers the ewe with impunity. Erect shelters in different parts of the paddocks, fields, &c., into which young lambs have to be turned, by placing hurdles in the section of a V, and fill them with straw or litter; these form a protection against the sharp winds which may prevail, and which are so productive of those fatal attacks of croup. About the third week in March is the best time for ewes, under ordinary circumstances, to begin lambing. Having been marked in rotation as they took the ram, those which are due first should have close attention, and should be put during the nights in an airy house or yard with shelter, and be seen at intervals of an hour or so. In cases of difficult parturition, let nature guide the shepherd, who should note the following, viz.:—Allow ample time before rendering assistance, and never attempt to extract a lamb without first having placed it in a natural position, which must be done patiently, cautiously, and dexterously. When much handling is resorted to, use black oils to prevent gangrene. If the ewe appears debilitated, give gruel with brandy or other stimulants with gentle purgatives. An efficient shepherd will not have triplets or pets, but will mother a third lamb, or one which may have lost its mother, upon a good nurse which has but one lamb. In cases of straining from after-pains, give laudanum and castor oil. The stock of roots intended to be eaten on the land upon which they grew, should be so calculated that they are finished by the end of this month, so that their presence does not interfere with the operation of sowing the land with barley or other spring crops. Then arises the question, where can the remainder of the roots be most advantageously consumed? I have tried three experiments, viz.:—Firstly, on old sward, the result on which was that there was no marked improvement in the yield of grass; and unless folded and frequently changed, the flock became almost simultaneously lame from inflammation, which generally ended in foot-rot. Secondly, on land intended for a root crop, with much more favourable issue than in the previous case, and when the breaks were littered with straw, a good crop of turnips followed, but they were much more unsound than others grown and manured in the ordinary way, either in winter or at the time of sowing. Thirdly, on wheat, the results of which I have found to be more satisfactory, but which, by the way, should be grown studiously for this object, viz., on light soil, and, if not, upon poor land after, say, oats or barley: the latter I prefer. In this case the fold should not be too large, and the flock removed once a-day.

APRIL.

The notes for the foregoing month with respect to ewes apply also to this. In case of twins, where one lamb is stronger than the other, muzzle it at short intervals, so that the weaker one may have its share of milk and consequently become a match for its fellow. In fine weather, dock, castrate, and flock-mark the lambs at from three to six days old. House for a couple of nights, apply paint on the necks of the *twin* lambs as a safeguard from foxes, and turn away the ewes with singles into an ordinary pasture; but those with pairs should have a good pasture, or in addition to a middling one be allowed mangolds, a little corn or cake mixed with chaff, malt-culms, &c. During this month a great saving of wool is effected by keeping the ewes free from doddings, which the young grass necessarily occasions. Mangolds often form part of the food of the sheep during this month, and they may be given with impunity to ewes, but not so with males, for when given ad libitum they cause an accumulation of sandy matter in the region of the bladder, which, if not quickly remedied, soon terminates in death.

MAY.

Ewes with twins should have cake so that the lambs may acquire a taste for it; and when they begin to eat it freely, it should be given in an enclosure into which the lambs only have ingress. In this month summering or pasturing may be said to commence, and I will here urge the necessity of frequent change of pasturage. Where the flock or a portion of it occupies but one field of clover, &c., it ought to be divided so as to admit of change, which is natural and beneficial to animals of the sheep kind—change appearing to be an innate principle. Water, too, especially to ewes giving suck, is indispensable. Rock-salt ought to be placed within reach of sheep all the year round, as it tends to keep them healthy. Too much cannot be said against early clipping: the disadvantages are so great and the advantages so small, especially in this cold climate. Why should we be the first to divest our sheep of their clothing when it has been proved that a sheep will, when shorn in cold weather, lose several pounds of flesh per week; and by this injudicious practice ewes giving suck are almost deprived of milk? I presume that such folly is kept up in some districts because most shepherds are anxious to shew fleeces at the first wool fair of the season.

JUNE.

The flock throughout should now be dipped, to secure the destruction of vermin on the skin, whilst the wool is short. Amongst the numerous compositions used for this purpose, I have found the glycerine to answer best. About the end of this month lambs may be weaned, when a better pasture can be afforded, and where they can rest and fare better than with their dams. Cast ewes are now put on good pasturage, with cake, &c., and forced as quickly as possible, so that when ripe they can be mixed off with a parcel of young sheep, and consequently fetch a higher price than when sold as ewes in one bargain. Stock ewes from this to the beginning of October should perform the office of field scavengers, by cleaning up all over-eaten pastures, paring down any rough swards, &c.

JULY.

In woody districts flies are now very troublesome, and their constant teasings interfere much with the quietude and well-being of the sheep. The flock, therefore, during this and the rest of the summer months should occasionally be closely packed in a pen, and have a sprinkling of a mixture of spirits of tar and sulphur from a garden watering-can. Their heads should be dressed with a similar mixture of thicker consistency, which is less heating, and, therefore, preferable to caps. These applications will ward off the flies, and contribute materially to the animals' comfort, and leave them to graze in peace. During this and the following month lambs require the especial vigilance not only of the shepherd but of his master; for it is a difficult matter, in the absence of a second crop of clover, or some such luxuriant herbage, to keep them progressing and healthy up to the time of placing them on turnips; and too much attention cannot be paid to the pasturage, change of food, &c.; for a few days on an over-gross old seed or pasture field may cause scouring, and otherwise so derange their weak and sensitive stomachs, that months may elapse ere they again begin thrive ; and even serious losses from death re too frequently resulted from this and dred causes.

AUGUST.

Stock ewes should now be upon inferior stures, and cost as little as possible. As stures, whether permanent grass or clover, w deteriorate in quality, feeding-sheep uld have a little extra artificial food, and o frequent change of pasturage. Lambs ght now to be placed on clover or grass termath. During the busy season of harvest e flock too frequently is neglected, and ould therefore be dipped just prior to the mmencement, in order that there may be s risk from maggots and loss of condition m fly-teasing.

SEPTEMBER.

Feeding sheep and lambs should now be t on turnips, some of an early sort having een provided for them. It is customary, and rongly advocated by many flockmasters, at roots should be cut from the first day. ow, after frequent tests, I have found that hen on white or other soft sorts, it is as well o let them gnaw the turnips, for in this way hey sooner acquire a relish for that which hey at first have a decided dislike to.

OCTOBER.

So that lambs are not dropped before here is a promise of grass—say the third eek in March—the ewes ought to receive he ram about the third week in October; a fortnight both prior to and after which they should be allowed a liberal supply of rape, mustard, or roots, so that they may be in an improving condition, which will ensure a heavy crop of lambs; and, I think, this is further secured by "stocking," which is at all times safe and economical.

NOVEMBER.

During this and the following month, swedes should be lifted, assuming that the soft turnips are finished, and that the feeding-sheep and hoggets are now on swedes. That portion which is intended to be consumed on the land should be pitched or carted into small conical heaps, of about one-and-a-half ordinary cart loads each, formed at equal distances—*i.e.*, if the land is of uniform quality throughout the field; but, if the soil should vary materially, then the heaps should be dispersed with due regard to this, so that the succeeding grain crop should vary as little as possible. If cake or corn is given, the troughs should be placed on the poorest part of the field. In storing the root crop, the distance at which the rows of heaps should be placed ought to be regulated by the magnitude of the flock, so that they pretty well occupy the distance from row to row, and the straw which has covered the preceding row of heaps should be nicely spread over the ground on the opposite side of the break to that on which the troughs must, for the sake of convenience, necessarily be placed, in order that that portion may be equally as well manured as the opposite side. In the days of cattle plague, when it was a difficult matter to get straw converted into manure, I used that article liberally for littering the breaks, with great advantage to the succeeding crop. Whilst on this subject, it may not be out of place to allude to the practice of wintering sheep in yards, although the system seems somewhat unnatural. When unfortunately obliged to adopt this plan, I found that sheep were disinclined to leave the yard when allowed to do so, that they consumed much less food than when in the fields, and that they made mutton rapidly; but the great objection to this course was the difficulty in keeping them sound. Manure made under sheep is of uniform and superior quality.

DECEMBER.

The treatment of the flock generally will not differ much from that of last month. The ewes may be allowed to range over swede land, now cleared of roots, and feed upon the tops, saving the expense of carting, which at all times savours of injudicious management. During stormy weather, give cotton- or rape-cake, whichever is cheapest, for I have found them of about equal value for feeding or milk-producing purposes.

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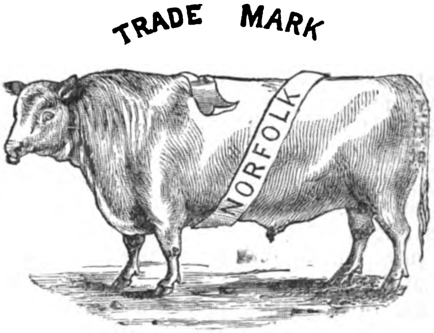

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IMPORTANT ADVANTAGES.—Small in size, easy to administer, warm and cordial in their effect, acting upon the bowels, kidneys, and skin, and suitable for all climates or any state of weather.

Their use is an immense improvement upon the ordinary dose of salts as a purifying or cleansing agent. Sprinkled among the food of Sheep or Lambs, these Drenches are readily eaten. One Drench for thirty Sheep or fifty Lambs per day will, by its alterative and purifying effect, immensely improve the condition of the animals.

SUTTON'S NORFOLK CONDITION DRENCHES

Are supplied to many well-known Breeders and Graziers of Stock, whether Cattle or Sheep. Among these may be mentioned the ROYAL FARM AT SANDRINGHAM, CLARE SEWELL READ, Esq., M.P., J. J. COLMAN, Esq., M.P., and others too numerous to mention.

The following unsolicited Testimonial is one among many:—

"Sandringham Park, August, 1878.—Please send me another supply of the Norfolk Condition Drenches. The men speak in the highest terms of their goodness.—Yours, &c., E. BECK."

THE LAMBING SEASON.

SUTTON'S NORFOLK CONDITION DRENCHES have proved themselves just the one thing required during this anxious time to Sheep Farmers. All the ordinary internal ailments occurring to either Sheep or Lambs are met by this medicine. One large Sheep Breeder writes:—"I used sixteen dozen of Sutton's Norfolk Condition Drenches during last season, giving them in small doses to both Sheep and Lambs, and I never spent better invested money in my life; I literally had no losses and no trouble, while my neighbours had both."

Manufactured for the Proprietor by

FRANCIS SUTTON & Co., Operative Chemists, LONDON ST., NORWICH,

Who will forward any quantity direct, either in Great Britain or abroad, on receipt of Bank Bill or Post Order. Price 12s. per dozen Drenches, in half-dozen and one dozen packets; or in three dozen tins, at the reduced price of 30s. The Drenches are all packed in parchment paper, and will keep good for any length of time in any climate. Fullest directions for use are given with each packet. To be obtained through any Chemists, Patent Medicine Houses, or Wholesale Drug Houses in England, the Colonies, or the Continent.

Wholesale Agents.—Messrs Barclay & Sons, W. Edwards, Sanger & Sons, W. Sutton & Co., F. Newbery & Sons, London; Messrs Smith & Sons, Norwich.

The Common Ailments of Live Stock.

UNDER this head, as supplementary to the ordinary KALENDAR OF FARM WORK, we give a popular account of the principal ailments to which the Live Stock of the Farm are subject at particular seasons of the year, together with the mode of treatment in the absence of a veterinary surgeon. Considering that those who have care of the domesticated animals of the farm should understand the premonitory symptoms of the various diseases which may attack them, and know what to do in emergencies, we have no doubt this section of the ALMANACK will prove alike interesting and useful to young Farmers, for whom it is more especially intended.

APRIL.

SURFEIT.

The most common affection among horses at this season is that usually known as Surfeit. The term is too frequently employed to denote any or all the disorders of the skin, and from this cause much confusion arises.

There are two conditions which strictly belong to this category, one characterized by few external signs, the other attended with numerous swellings. The causes of each are very similar, having their origin in a disordered state of the digestive system, added to which certain adventitious influences are exerted, and so produce modified conditions.

In the first form of surfeit, commonly known as prurigo or pruritus, there is an intolerable degree of itching, which causes the animal to rub himself violently against everything he can get near, and in these acts the hair of the mane and tail is extensively removed. The skin becomes very hot, and there is sometimes a degree of attendant fever. In some cases the irritation is mainly confined to the legs, and cart horses thus affected, which are the most common victims, are nothing short of a nuisance, from the continued noise they cause in stamping, and rubbing together of the limbs when in the stable, besides the injuries inflicted upon the soft parts by the heels of the shoes, &c. In old established cases the skin is thickened, the scales (outer layer) are considerably increased, and large patches of this nature are spread over the surface of the body, the hair being entirely absent.

The second form of surfeit is known as Nettle-rash, or Urticaria, and makes its appearance at this season of the year in the nature of sudden eruptions in different parts or over the body. The swellings vary in size, from a hazel-nut or walnut to that of a man's hand. In one instance, which occurred some years ago under our observation, the disease assumed the shape of a broad belt, and extended from the side of the neck, over the shoulders, ribs, and flank, to the haunch. Occasionally the swellings are but few, small and isolated, while the more severe cases are attended with febrile symptoms, and even attacks of disease in the respiratory organs. The swellings also now and then under irritation enlarge and are converted into abscesses, particularly about the back and neck, beneath the collar or saddle, and other closely fitting harness. Great irritation sometimes attends this affection.

Plethoric animals, or those having a full habit of body, are mostly affected, particularly when the food is too rich and abundant, or after such is supplied too rapidly after animals have been badly fed and housed during the winter. Sudden chills and draughts of cold water while in a perspiration are common causes; prevailing cold winds from the north or east during the early spring, with the powerful sun in the day-time, have a great influence upon the system, because at this time it is laid under heavy contributions for supporting the growth of the new coat. The swellings may last from ten or fifteen days to many weeks, sometimes occasioning no perceptible uneasiness or disturbance, while the simple pruritus, or itching, will remain upon the animal for a year or more.

The treatment in each case in its simplest form consists of a low diet of bran mashes with linseed tea, &c., for a few days. The bowels should be freely moved by a purgative; and a lotion, composed of one or two ounces of tincture of arnica, or merely spirits of wine, to a pint of water, may be sponged over the affected parts two or three times during the day. The severe itching is sometimes very readily allayed by using weak acidulated solutions, as two ounces of the oil of vitriol to one gallon of water. The hot air bath is probably one of the most effectual remedies.

If the respiratory organs become affected, the treatment assumes a more difficult nature, and the advice of a skilled veterinary surgeon is desirable.

STINGE IN OXEN.

The second form of surfeit, as noticed already under the technical term of Urticaria, is sometimes seen in cattle during the hot days of the spring and summer months. There is one special peculiarity in its mode of attacking these animals, arising, no doubt, from the different habits and other conditions. It is seldom to any extent over the body, but mostly appears very suddenly in the shape of swellings about the muzzle and nostrils, extending some distance along the skin and lining membrane of the nose; and there, impeding the passage of air in respiration, produces distressing symptoms of suffocation. The common remedy of the cowman and dealer is the use of the knife, with which he divides the septum, or partition of the nostrils, and thus effects a local blood-letting, which relieves the parts.

The cause is plethora suddenly produced by rich food and inactivity, especially after scarcity. Animals previously confined during cold weather on bad pastures, and incautiously turned upon others that are forced by warm weather and gentle showers, are the usual victims. This fact should be noticed by farmers, in order to guard against the affection by a regular system of usage and preventive measures. Purgation, water containing nitre for a few days, and a less stimulating diet are the usual means necessary for effecting a cure, and also warding off attacks in animals that are observed to be "doing" too well.

CHAFES AND GALLS OR FRETS.

Another source of annoyance among working horses at this season, is the frequency with which the skin is chafed and rendered sore in some animals. As soon as the days become warm and close, they perspire freely, and dust readily adheres to the damp surface; the harness rubbing or flapping over the skin afterwards very soon removes the hair, and creates a red and tender spot, or still worse it is raw, and, besides being red and very sore, discharges a thin clear fluid. Horses that are badly groomed are common sufferers, and those having collars too large, saddles and other parts fitting badly, or probably working with one trace too long, often return to the stable with very bad wounds.

Under all circumstances great attention should be paid to working animals at this season. The skin should be thoroughly cleaned, and the harness likewise freed from all accumulations of hardened sweat and dirt; and those parts which admit of the process are best treated with an occasional dressing of oil. As horses increase or decrease in size, great attention should be directed to the collar, as any alteration in the condition may render this part of harness a very dangerous member during even a moderate journey or day's work.

The treatment of chafes is very simple, arnica lotion, composed of one part of tincture of arnica to twelve of water, is a good remedy. It may be applied by a sponge or soft rag. A little nitre may be given in the bran mash, and the parts when very raw should be dressed with glycerine, and then dusted with flour.

MAY.

ABORTION (?) OR PREMATURE LABOUR IN MARES.

It is common at this season to hear sad accounts of farmers here and there losing foals in premature birth, and sometimes the loss is extended to the mares as well. From the frequency with which such have taken place in successive years, and have come beneath personal observation, after carefully estimating all conditions, we have concluded that 99 per cent. of such losses ought not to occur. We may therefore usefully consider the subject in a separate article.

Last month we gave brief consideration to a variety of skin diseases which come within the category of ailments of the season, the result of sudden alternations of temperature, acting powerfully upon the internal organs engaged in the digestive process and manufacture and elaboration of material for building up and repairing the body. We now proceed to explain how the process of such disorder will in the end produce the so-called abortion or slipping the foal, and premature labour. At this season, however, the term abortion is scarcely in its place. It really means *unfinished* as well as untimely, and is more properly applied to the expulsion of the contents of the womb at a much earlier period of pregnancy before the conditions of life are fully establised in the young creature. On the other hand, premature labour should be the term employed, because many foals are dropped *before* the time, *i.e.*, prematurely, yet may be brought up and do well, and the means necessary for their expulsion are in every way nearly the same as when parturition is delayed the full time. The term abortion is nevertheless in common use to indicate both events, but, as we have endeavoured to shew, being incorrectly so applied, we shall avoid it altogether, substituting the more intelligible term, "premature labour."

The effects of the application of cold to the skin at the time preternaturally heated, perhaps moistened, with perspiration, when the results are more speedy and permanent, are the contraction of superficial blood vessels, and determination or driving inwards to all large organs a large quantity of blood. At the time of pregnancy the womb of the mother requires a great amount of blood for the nourishment of the fœtus, and under the influences of cold, wet, and exposure, it is not unlikely that the amount sent there may act injuriously. The fœtus may suffer from general congestion, and even inflammation, and thus a partial or complete arrest of circulation may take place in its body. At other times the placenta or after-birth, through which all the blood passes from the mother to the offspring, may become, through the causes already mentioned, partially or completely involved in congestion or inflammation, beginning in small spots or centres, afterwards spreading outwards, and by the union or confluence of many of these spots, interrupting the flow of blood entirely. From both these conditions the fœtus is deprived of support, and consequently dies in the womb and must be expelled. Another cause of death of the offspring at this season is the condition of the mother as depending upon the food, shelter, and general treatment during the previous part of the winter. Many farmers are too careless about the comfort and well-being of their pregnant animals, and vainly imagine that, as there may be little or nothing for them to do, they may endure, without damage, a fair winter's short commons, and make up for all deficiency when grass comes again. This is a very delusive and destructive argument, for the pregnant animal, above all others, requires more support at the time, for she has not only her own body to nourish, but all her functions are exerted to make blood for the rapidly-growing fœtus and membranes inside the womb. She should, therefore, have proper food, and every domestic comfort, so as to keep up the natural functions to a suitable degree of activity; but if she is allowed to become poor, to subsist on common, coarse, and bad food, the blood becomes poor and fails to nourish the offspring, and it is born small, weak, and prone to disease. If it survive the first few weeks of life, it may grow up a sickly thing, liable to rheumatism and deformities, lameness, &c., and prove of more trouble than value.

The general result, however, is that during the early spring, more especially if the weather prove mild and showery, and grass abundant, or if larger supplies of food, particularly of the artificial kinds, are given, that the weak and poverty-stricken animal begins to make blood too rapidly. The womb, the membranes, and even the offspring also suffer so much from the sudden flushing, that acute congestion or inflammation quickly follows, and the circulation is at once arrested. The offspring suffers from a species of strangulation and dies. Premature labour of course takes place afterwards, for the dead fœtus becomes a foreign body, and must be expelled. There is still another common cause of death in foals at this season. This is the effect of violence of various kinds. All, of whatever kind, tend to produce the same round of conditions which terminate in the same result—cutting off the supply of nutrition between mother and offspring, which causes death of the latter. When mares are turned into pastures for the first time in the spring they are apt to play, gallop, and roll about. Rolling on the ground is a most fertile source of premature labour.

The men should be cautioned against allowing mares in foal to go loose too soon after coming in from work, and more especially if they are warm or are suffering from surfeit in its various forms. Even when the harness is removed an amount of irritation is sometimes set up by the application of cold to the parts that are moist with perspiration, as beneath the saddle, collar, &c., that no sooner does the animal find herself free than she rushes out of the stable and commences to roll in the straw-yard, or pasture. Heavy work at plough or drawing loads, severe and even moderate trotting in saddle or harness; concussions received in passing through doorways when two or more are trying to pass at the same time, are fruitful causes of premature labour by producing death of the foal first. The connexion between mother and offspring is broken off—ruptured—and the latter dies as a consequence.

But premature labour is not as a serious question confined to the foal only. The mare as frequently suffers, and, if she does not die, the effects of an untimely birth may render her weak and unprofitable during a whole summer. It must be borne in mind that as the time approaches for natural delivery a great many necessary conditions are being established, and these are only complete at the time when the foal is born. Among these are the relaxation of the ligaments uniting the hip bones so as to widen the birth passage; the other is the proper position of the foal. There are, besides these, other important features, but we need not stop to notice them now. It will, however, be understood by this enumeration that if the foal is dead from any cause already named, and the period of delivery is yet far distant, the proper relaxation of ligaments and position of the foal will not be secured. Parturition is therefore difficult and attended with danger. The passage is too small, and malposition frequently makes matters worse, so bad, indeed, that the most skilful obstetric practitioner may fail to save the mare by effecting early and safe delivery.

It is sufficient for the watchful agriculturist to be informed of the causes which singly or combined may cause loss among his stock, and we feel assured if they were made a more general branch of study, mortality might be very much reduced among all kinds of stock. But while we have pointed out the evils of improper food in pregnant animals, we must not omit to state that excessive evils are sometimes—nay frequently—born of kindness, and some creatures are even killed by it. Large quantities of highly nutritious food, especially when accompanied with close confinement, may engender constipation, and succeeding that indigestion of an acute character—colic. If the animal rolls about in these attacks the fœtus is likely to be torn from its attachments in the womb and premature labour take place; but the attack may kill the mare also by causing rupture of the stomach and some portions of the intestines.

JUNE.

COLIC.

The cause of colic has been attributed in special seasons to the scarcity of the usual kind of food, and substitution of coarser and inferior articles; and if the spring is late, causing the work to be much behind, and necessitating extra and severe exertion, the ordinary death-rate from this disease is surprisingly augmented, especially with pregnant mares. Thus animals over-taxed by work and below the mark in point of ability or condition, are more predisposed to disease, and, consequently, suffer most under the prevailing cause.

Although colic is an affection frequently rendered more frequent during the spring throughout England, it very rarely amounts to the nature of an epizootic as it sometimes appears to have done in Scotland. The primary cause doubtless exists in the *preparation* of the food. The English farmer has a wonderful faith in roast beef as an element of strength, and wisely adopts it as an article of somewhat extensive use at his own table; and, reasoning from analogy, believes also that good corn, as peas, beans, and oats, furnish the most of what goes to form solid horseflesh, and therefore employs them more or less as manger food for his working horses. He practises a sparing use of roots, and adopts no system of preparation beyond cutting or bruising the fodder and grain. In Scotland, on the other hand, the food, even when of the best, is cooked, by being boiled or steamed; roots enter largely into its composition, and not unfrequently, the ingredients are not over good, as the cooking somewhat disguises it, and therefore an excuse is gained for the exercise of this kind of doubtful economy. Colic has always existed among all kinds of horses in Scotland 60 or 70 per cent. more than in England, and in every instance where the cooked food system has given way to sound dry corn and sweet fodder, the mortality has decreased. Colic is an affection which should never, or at the least, very rarely be seen among horses. Where good management exists, it is all but unknown, and where a horse is affected cure very speedily follows the application of ordinary remedies. We are now referring to large establishments where the horses are put to rapid and heavy work, where rest days are few and far between, but where it is thought to be best policy to feed liberally and upon the best kind of food. Hard work, exposure, combined with inferior food, and especially cooked messes, which are quite unnatural to the intestines of the horse—are very prolific causes of colic and collateral diseases of the digestive organs. Chronic disease of the liver and kidneys is also common, and one affection which results from constant disorder of the digestive process, viz., Albuminous Nephritis, rarely seen in England, is of very frequent occurrence in Scotland.

In this country, colic generally arises from the practice of giving too large quantities of food at once, particularly dry chaff and grain, after long fasts, and then allowing the animal to swell himself with water. By this practice the stomach is enlarged and weakened, digestion is also more or less impaired, and the result is as we have said—disease, sometimes chronic, and at others fatal, from rupture of some important organ, as the stomach or large intestine, &c. Another cause arises from the practice of turning hungry animals upon plentiful pastures, or allowing too much green food the first time in the season.

One result of colic which sometimes leads to a great mistake, is that in which, after death, the greater part of the intestines are discoloured and black as a coal. It may happen that one portion of the canal slips inside itself as it were, a condition known as invagination or intussusception, occasioned by violent straining; in some cases also when the animal rolls violently, the expansion of membrane known as the caul and technically the *peritoneum*, which unites the intestines to the spine, is torn, and some portion falls through the opening. In each of these cases strangulation of the gut follows, and death soon afterwards, but the intestines are blackened only in the immediate neighbourhood of the accident. The condition we more particularly allude to is that in which fermentation within the stomach and intestines has been going on for some hours, and by constant pressure on the portal vessels, the flow of blood towards the liver is arrested. This prevents the veins of the intestines discharging their contents, and in turn we have extensive stagnation. The pains of colic from being unusually severe, gradually lose their intensity, and the animal ceasing to roll about, persists in standing, resting first one hind leg and then the other. The pulse becomes small, rapid and imperceptible, breathing short, quick, and catching; cold sweats bedew the body, and after a few hours he drops down and dies in a few minutes. The arrest to the circulation of blood from the intestines towards the liver gives rise to an extensive and general strangulation. Sensation is destroyed, and the parts begin to die; but being so essentially important in the maintenance of life, the animal dies before mortification ensues. These cases, we have said, are liable to be mistaken for each other—local strangulation or invagination confounded with that arising from pressure on the portal vessels. Nice discrimination is necessary, therefore, and a careful post-mortem examination will not only determine the true state of affairs, but also suggest the cause—an essential matter in the course of prevention.

In the *treatment* of colic, there are as many opinions almost as stars in the firmament; and in course of practice, the advocates of each will produce corresponding results of a successful character; but this says little where all cases, arising from different causes, are treated by the same stereotyped remedies. Some advocate trotting the animal about, and even flogging, to keep him upon his legs.

As the animal finds most comfort from rolling about, the stall (a box or empty barn is much better) should be well littered down with straw, and there he may be allowed to indulge. Medicine should always be at hand where horses are subject to colic, and the proper dose given at once. Oils of all kinds are too slow in action, and, besides, they nauseate the horse long after the attack is over. Nothing answers so well as aloes, given as a bolus or in solution, as preferred, the objection being on account of subsequent purgation, which may be induced. To obviate this, the following form may be used with great benefit: Solution of aloes, 4 ounces; sweet spirits of nitre, 2 or 3 ounces; essence of ginger (concentrated), 2 drachms—mix, and give at once; and if no relief follows in one hour, repeat the dose. Injections of soapy water are most valuable, and should be passed up the rectum at least every hour, until relief is obtained. The use of pepper, onions, ginger, &c., to the rectum, sheath, or vagina, for the purpose of inducing the animals to urinate or stale, is to be condemned as cruelty, as no relief is gained by the passing of urine; the affection is not connected with the kidneys, and the frequent attempts made by the animal do not indicate that, but rather disorder in which all parts almost participate.

In all cases *tepid* water may be allowed the animal to drink if he will take it, as the action of medicine will be greatly facilitated when much food is present, and there will be less liability to its becoming hardened and forming large dry cakes or lumps. The next thing of importance is to make the animal as comfortable as possible, and to do this he should be frequently rubbed down and the bed kept as straight as possible.

When much fermentation is present some practitioners use spirits of ammonia, in ½ oz. doses largely diluted; and in order to allay excessive pain, powerful remedies are injected beneath the skin; but as a rule the simple means we have pointed out are generally successful.

The *prevention* of colic lies in the use of proper food—sound, dry provender—in *moderate* quantities supplied at regular intervals. Care should be taken to avoid long fasts, and the supply of large quantities of food, and especially cold water afterwards. The stomach being then weakened is not capable of true digestion, and the animal, very hungry, bolts the food without proper mastication and insalivation. All kinds of food which require cooking to make them savoury should be rejected. If they are not *naturally* tempting to the animal, no artificial preparation can make them useful or economical, as they produce disease, and the loss in the end is greater than the saving at the beginning. Bran or linseed tea may be given with chaff and corn, also a moderate supply of roots to promote a sufficiently loose state of the bowels, and when horses are turned upon grass, or green food is supplied the first time in the spring, they should not be allowed to eat their fill. Large quantities of food at all times are dangerous, but more so when they happen to be of a fresh and succulent kind.

BLACK-QUARTER.

Young cattle at this season of the year are liable to a form of blood disease which proves rapidly fatal, and from which probably the losses are greater by far than from any other known non-contagious affection. Black-quarter—or as it is variously known by the equally vulgar titles of Quarter-evil, Quarter-ill, Puck, Speed, Hasty, Black-leg, &c.—is purely dependent upon the condition of the blood as influenced by various circumstances connected with age, management, pasturage, &c. Young cattle are alone liable to it, at least it very rarely happens that cows after having had a calf become affected; and when instances of so-called black-quarter have appeared in the latter kind of stock, the disease assumes such characters as to go far towards establishing peculiarities incidental to that age only. There is then some doubt existing as to the truth of statements which relate such events in older animals. Young cattle in which the disposition to thrive rapidly is apparent, are the common subjects, because any excess of blood is not drawn off by Nature's acts as in older ones. In the first all goes to the formation of blood, but in the older animals pregnancy, the secretion of milk, together with greater wear and tear of the system, are causes which act as the safety-valve, and thus prevent any of the effects of over-repletion.

Black-quarter occurs more frequently at this season than others, from several causes. If the preceding winter has been attended with scanty pasturage, stock generally is limited to smaller quantities of food—in some cases, injudiciously so—and the quality may, likewise, be none of the best. Again, dry fodder forms the bulk supplied, all of which are not in any degree famous for furnishing large quantities of rich nutriment to the system. Besides, cold weather has much to do with the fact that black-quarter cannot take place to any extent in winter; the digestive organs are in greater activity, supplying the elements of heat which the body requires so much. But as soon as the grass grows, forced by warm rains and bright weather, the animal obtains far more nutriment than the organs can appropriate; they become surcharged, the bloodvessels throughout the body are also seriously overloaded, and the blood itself so very rich, that in various parts beneath the skin, over the quarters, back, or legs, &c., the vessels give way, and allow the blood and lymph to exude, and cover a space of variable extent. If the hand is passed over the parts a loud kind of crackling noise is given out, an effect due to the decomposition of the effused materials and disengagement of air.

Certain pastures, sometimes whole farms, are productive of this disease, and farmers have been ruined in consequence, which circumstances point to the advisability of turning over the ground by the plough, and for a number of years grazing off newer pastures. But in many instances by the exercise of proper care the disease may be avoided without even that course, at least for a time.

Black-quarter, as already stated, is rapid in its appearance. Animals well and hearty at night are found dead next morning, and rarely, even in the slowest forms of attack, are there any particular signs beyond slight lameness or appearance of unusual excitement. To these are quickly added laboured breathing and intense pain, and the creature falls or lies down never to rise again. If the course of the disease is slow and attack slight, the parts affected will slough and form unsightly sores, which heal with great difficulty; and not uncommonly the mouth and tongue are covered with blisters, which after bursting exhibit the same characters.

The treatment of black-quarter is a most difficult matter, as affected animals are seldom seen until it is too late. Blood-letting and purgation should be resorted to at once, where practicable; and if such be successful, in a day or two afterwards, the inevitable prostration of strength must be combated by stimulants, the sloughing sores requiring solution of chloride of lime, &c., to keep down the intensely disagreeable smell which arises from them.

In the way of *prevention*, much may be effected by general management. Young stock should receive a more liberal allowance of nutritious food during the autumn and winter months, by which they will grow and develope more gradually, and thus be prepared for the sudden effects of rich and succulent grass at the beginning of spring and warm weather. It is advisable also when the grass of pastures is found to spring rapidly and in large quantity not to allow young stock to graze too much upon them, but rather limit the feeding to two or three hours daily for a time, taking care to have partially grazed pasture to turn them upon for the remainder of the day. Some breeders have practised with success the plan of sending the stock for a walk of two or three miles each day, thus creating a demand for the food consumed by the waste occasioned by exercise. Next to these precautions, the use of surgical and medicinal remedies is beneficial. For a great number of years we adopted the use of a long seton in the loose fold of skin (dewlap) in front of the breast, with great success. This was *not* put across, but caused to pierce the skin at the lower third of the neck; the needle armed with broad tape was carried down to the bottom, at least 12 or 15 inches below, where it remained over two months, causing suppuration, which had the effect of usefully counteracting any tendency to making blood too rapidly. The pain and inconvenience produced also had, doubtless, much to do with the benefit arising from it. Some object to the seton because they consider it spoils the form of the dewlap, but we consider it not only a more effective but decidedly a more honest proceeding than the operation of so-called "nerving," which many quack pretenders recommend, simply because no nerve is found where they search, therefore the affair is a downright imposture.

The rest of the treatment consists of the timely use of a purgative drench, consisting of 6 or 8 ounces of Epsom salts, two or three drops of Croton oil, and 1 ounce of ground ginger. This we have usually administered at the time the seton was inserted, taking care to keep the animals in the straw-yard for shelter for two or three nights afterwards, if the weather was at all cold or showery. Afterwards, if the tendency to plethora was at all great, we adopted the use of powders of neutral salt, such as the sulphate or chlorate of potash, mixed with linseed meal or bran, 1 ounce of the salt being allowed for each animal, twice or thrice a week, for about two months. By these means we have succeeded for years in keeping away blackleg from farms, on which previous tenants have been starved out. In order to cause the creatures to take the medicines a little trouble is required, but if it saves the lives of one out of a hundred something above an ordinary remuneration is obtained. The salt finely powdered is carefully mixed with five or six times its bulk of bean, bran, barley, or linseed meal, and afterwards thrown amongst green food which has been cut in the chaff machine. This mixture may be put into troughs or mangers in an open shed or farm-yard, where the animals can be taken after grazing upon the fatal pastures, usually taking care to keep them an hour or two previously without food. We have, however, under certain circumstances, used the powders without any removal from the pastures with every success.

JULY.

POISONING OF SHEEP BY DIPPING.

As each season comes round, and the operation of sheep dipping is necessarily put into practice, we are apprised of deaths taking place, in some instances few, but unhappily, in far too many, great numbers being carried off.

With large, fat, and heavy sheep there is always a great liability to accident, and particularly among ewes that are pregnant. The necessary handling induces a great amount of excitement, and pressure on the lungs becomes so great that suffocation, when the creature is turned on the back, is very easily produced. To obviate this, we do not see why sheep of all kinds, when they need dipping, cannot be immersed in the bath *feet downwards*. A thoroughly practical and scientific veterinarian, Mr Dickinson, of Boston, Lincolnshire, whose assistants pass through the bath many thousands annually, has for some years adopted this plan. The sheep is placed in a suitable cage, and by a simple lever raised and lowered in the bath, and this means entirely obviates the casualties we have mentioned.

But there are other causes for mortality and destruction of sheep in dipping besides suffocation in handling, and the most common and fatal is the use of metallic preparations for the cure of scab and killing the parasites that abound in the fleeces. Arsenic and corrosive sublimate are substances which enter largely into the composition of these dipping mixtures, and we learn that a well-known, largely-advertised nostrum, which is principally composed of arsenic, was used on the occasion named in the commencement of this article, by which forty animals were rendered lifeless in somewhat less than four hours.

Popular prejudice, fostered by emblazoned show cards and handbills, announces that no other remedy can be used which will destroy the parasites of the fleece; but here prejudice makes a great mistake. Sheep-dipping, like many other operations, is too carelessly and too seldom done, and, as a result, the dipper resorts to a most deadly remedy, which not only kills the parasites, but also the sheep, and thus adds to the annual mortality which we have too much reason to deplore as already too great, and more than we can afford. Besides this, sheep farmers are frequently at fault in turning newly-dipped sheep back to the same pastures and localities which abound in the parasites which torment them; and newly-clipped sheep are allowed to mingle with lambs without any precaution being taken to guard against the passage of the lice, tick, &c., from one to the other. Thus, the operation confined to ewes only is but a proceeding which favours the parasites seeking greater warmth in the thicker and close fleece of the lambs. When ewes are dipped, it would be well to dip lambs also, and in using a compound, that selected should be one not essentially for bleaching and cleaning the wool, but for its power of attaching itself to the fibres of the fleece, and thus render it untenantable by the parasite. There is, however, some difficulty in the choice of materials which will effect this, and more so when the bath is used, as all substances cannot be conveyed in a watery solution. For this reason we advocate the more effective, although slower plan of *pouring*, with which every sheep-farmer is thoroùglhy conversant. By this many agents, perfectly harmless to the sheep, but deadly poisonous to the parasites, may be used, conveying comfort to the animals, effecting a more speedy cure, and preventing not only the loss of flesh, which is never regained, but also the loss of animals themselves.

BRAXY IN SHEEP.

Last month we gave a brief account of one of the common affections of young stock, viz., "Black Quarter," which belongs to the class of blood diseases, and we have now to notice another, in the same category, but confined entirely to the sheep.

In all classes of animals we find a prevailing tendency to succumb to one form of disease at one period of life, and at a later to one of a different kind altogether. Thus, young cattle are liable to black-quarter, but the conditions that produce that affection give rise to other blood diseases, as apoplexy of the spleen, and among pregnant animals, another form of apoplexy, which we shall notice at a future time. Likewise, in young animals, the acknowledged causes of black-quarter of cattle develop in sheep the affection known as black-spauld, but older animals contract what is known as braxy.

Among the various signs which characterize the malady, diarrhœa or obstinate constipation form prominent features, and the hill shepherd recognizes the first as dry braxy, the latter as dumb or water braxy. The animals are usually attacked suddenly by giddiness and staggering gait, the head is elevated and he falls forward, and, after convulsions more or less protracted, dies. Sometimes the course is slower, but rarely. The wool sticks or lies flat on the skin, and is harsh to the touch, obstinate costiveness of the bowels speedily gives way to excessive looseness, violent straining, and colic; and in certain instances the cases prove tedious and characterized by lingering fever. Putrefaction goes on rapidly in the body after death, and its evidences are even present during the last few moments of life. Air is largely present in the first stomach or paunch, also beneath the skin and between the muscles and membranes of the body; and when liberated by the knife it is frequently unbearable from the powerful odour of decomposition by which it is impregnated. In some cases, even before death, air may be detected under the skin by passing the hand over it, when a perceptible crackling will be heard.

After death a bloody froth fills the nostrils and windpipe, and in the abdomen a reddish coloured thin fluid is found. All the organs and blood-vessels are charged with very black blood, and dark red or black spots and patches may be seen upon their outer side. The heart is full of blood, and all the muscles of the body are darker coloured than natural.

Braxy is an affection which, like black-quarter, will pay better in prevention than cure. The sudden nature of the attacks and rapid progress of disease admit of no proper course of medical treatment, therefore it is desirable to attempt a system by which the origin may be arrested. For this purpose in hilly districts more shelter is required, by which the effects of exposure will be considerably mitigated; and in autumn and winter, when natural food is scarce, dry or artificial kinds should be substituted so as to prevent the animals becoming low and weak. In spring and summer, when food is abundant, great caution is required in management; for those animals which are thriving rapidly, especially after being kept low during cold weather, are most likely to be the victims. Likewise, during moonlight nights many are affected, as a result of over-repletion, and during sharp frosty mornings, as an effect of exposure, when the blood is heavily charged with highly nutritious elements. If possible, more exercise should be given to the most vigorous animals, and a proper action of the bowels ensured by suitable food of a laxative nature, and occasional doses of saltpetre, which may be given among bran or linseed-oil cake, &c. Bleeding and purgation, in some instances, are quite called for, and sudden changes from poor to rich food should always be discountenanced. While a system of growth and development is to be promoted by suitable food, it should be induced regularly and gradually, which in the end will prove far more profitable than scarcity during autumn and winter, with a careless and sudden turning upon rich succulent food, at a season when the system does not require so much and is least able to bear a direct overcharging by it.

AUGUST.

SPLENIC APOPLEXY AMONG CATTLE AND SHEEP.

Among the many affections common to domesticated animals there is none scarcely which has given rise to as much controversy and speculation as splenic apoplexy. Observed only by a few within the past twenty years, it has been considered by others quite a new and totally distinct affection; but when the archives of veterinary literature at home and abroad are searched, evidences are abundant of its previous existence, and careful records shew that scientific men have long been alive to its fatal effects, and no less active in attempting to fathom the cause as well as to solve the problem of cure and prevention.

Like Braxy and Black Quarter there is always present a tendency to sudden and dangerous plethora in all the victims. The best and most active in thriving are first seized, and rarely recover. As stall-fed animals have been most frequently affected, the conclusion first arrived at was that food rich in nutritive elements, supplied in superabundance, with warm stables, and no exercise—all conducing to the formation of blood too large in quantity and too rich in quality—was the sole cause. So far the conclusion was found to be correct. After death the spleen or milt is found to be engorged with black blood, ruptured, and its structure broken down. Besides, other organs unmistakably exhibited the usual indications of blood-poisoning; and when active measures of prevention were set on foot—when food less nutritious, and suitable medicines were administered, and, in addition, more liberty has been given to the animals previously confined too closely, the malady has rapidly disappeared, but always recurred when the same system of forcing has been again adopted. Among sheep too close folding, with similar conditions as to food, &c., the same results have arisen.

The affection is peculiarly remarkable from the fact that the flesh of such animals dying from it is quite unfit as an article of food, and when partaken of by dogs in a raw state it proves highly poisonous to them. If the butcher, in flaying or cutting up the carcases, should by chance wound his flesh in any part, a rapid and violent death is almost sure to follow; and animals following the victims—cattle or sheep—and grazing where their blood or saliva has fallen, are safe to suffer fatally. From such occurrences, which have now and then taken place, it has not unreasonably been concluded that the disease is contagious or catching. There is, however, this difference: a contagious malady usually reproduces itself in other animals of the same species, but splenic apoplexy does not. A blood poison of another form is engendered even more rapidly than splenic apoplexy itself.

Since veterinary science has extended so much of late, and men of greater acumen have enrolled themselves in its ranks, observation in connexion with some of the obscure and less known ailments of domestic animals has been encouraged and stimulated; and, as a result of this, we are now able to add other causes besides a highly nutritious food and want of proper exercise, which give rise to splenic apoplexy and its allied forms of blood poisoning. Our intimate acquaintance with some of the large grazing tracts of land, especially those lying low and suffering from long periods of inundation, with insufficient drainage, has furnished many instances which prove that the soil has greatly to do with the production of this affection; and, again, on some farms where a system of heavy manuring is practised on the low-lying meadows, such diseases have occurred with regularity and sudden fatality. In addition, also, in such localities the presence of a pure spring or rivulet of clear running water is rare. That which drains from the land is rich in organic impurities and salts, the result of decomposition of animal matter; and the vegetation growing upon the surface of the soil is thoroughly impregnated with the same impure fluid. As a rule, drainage carries off all excesses of this kind; but in the instances we are considering, the want of drainage, with impure and stagnant water in ponds, ditches, or so-called rivulets, militate against the efforts of the soil to unload itself. The soil has a remarkable power of disinfection, by which the rotting or putrefying ingredients of manure are at once chemically altered and the odour destroyed. The sun and air, too, play no less important parts in the work of transformation. The first promotes the destructive process, and the latter dilutes the odour arising from it, at the same time by the ozone it contains, suppresses or neutralizes it. But there is a stage beyond which the soil may not have its corrective influences: it may be so charged, and is being constantly saturated with manurial elements as to be positively poisoned by it. The water draining from it, and the vegetation subsisting upon it are likewise poisoned, and the animals subjected to an existence upon all of them likewise succumb to fatal blood-poisoning. In such cases, the land, to be safe, must receive attention, the brooks or ponds must be cleared, or sun and air over the surface are but so many more agencies for the promotion and propagation of malaria and fell disease. It is quite as possible to overdo the land with manure as to be guilty of starving it, and no condition is worse than that in which it becomes naturally impregnated with animal matter as a result of locality, bad drainage, and frequent inundation. Top-dressings of lime or common salt may do good if all other manure is withheld, but the best system is to make the brooks run, if possible, or create a new and pure supply of water, close up all the stagnant pools, and put such pastures under crop for a few years. Of course, all this is easier said than done; nevertheless, if we consider the annual mortality arising from these affections, the proceeding will be found to be of practical importance, and ultimately saving to the extent of thousands of pounds. With the present conditions before us, it is now a serious question with every one whether more land under grass is not required; and if the necessary attention to breeding and grazing be stimulated and encouraged, as it ought to be, to meet the growing demands of our country, the plan of turning over the oldest and most fatal pastures should be adopted in rotation, others, hitherto long under the plough, being laid down to take their rest accordingly. Setting aside these principles, we shall always fail to eradicate such diseases by medicines alone. No system is complete that does not embrace a wider range of action, and none so elaborate and effective as mutual blending of the resources of the sciences of agriculture and veterinary medicine in their widest and fullest acceptation.

BLINDNESS.

Among the numerous maladies which seize upon our domestic animals at this season of the year, ophthalmia, or blindness, is not uncommon. Apart from the usual form of disease, which from its general character, mode of attack, and connexion with variable temperature, &c., is usually known as a cold in the eye, there is a variety of blindness which attacks frequently a great number of animals in the same locality during hot weather; and from the large area of country over which it seems to be spread, it is somewhat difficult for those unacquainted with medical science to reconcile their ideas with the assurance that such a disease is positively "not catching."

Certain conditions, however, are necessary to give rise to the form of ophthalmia we are about to notice; and hence we find that as seasons are not always of the same character, there are modifications of the affection. In moderately cool or gloomy weather, or during alternate hot and showery days, the disease may not be seen; but if the sun continues to shine with great power and brilliancy, if rains are delayed, and worse still, if there is no shelter for the animals, blindness will often run rapidly through whole flocks and herds. Under these circumstances the grass is arrested in its growth, and speedily disappears; food becoming short necessitates the continued movements of the animals in search for it; and the eyes are exposed to the effect of reflected light and heat, from which intense inflammation is set up: the products of the action occupying the whole of the interior and posterior chambers of the eye, obliterating the function of sight entirely.

Our ordinary summers are not, as a rule, remarkable for a long continuance of Indian temperature, yet for a few days, in certain districts, the effects are sometimes very severe, and this is most particularly felt upon the white clay, chalk, and light gravelly soils, as well as on the salt marshes, where the light-coloured and bare sandy soil prove as equally powerful in transmitting injurious heat and light; and in such an event cases of blindness are not uncommon. Sheep often suffer very severely, and present a most pitiable appearance by their inability to proceed without assistance, running against each other or the various objects which happen to be in their way.

There is, however, some difference between this form of blindness and that which happens late in autumn, in winter, or during cold and wet springs. The summer blindness is wholly a result of the powerful rays of heat and light transmitted from the light-coloured soil, which is destitute of its usual covering—grass. If there is no opposition to the growth of grass, and the ground is well covered, no harm happens, the colour of such vegetation being wisely ordered as a most useful and effective neutralizer of light. It is only after the soil is grazed close, and it becomes dry, hard, white, and hot by continued sunshine and drought, that such blindness comes on; and it rarely happens that few cases only are seen—the usual course is for the affection to spread over the whole of the parched-up and sunburnt district.

The treatment is simple, and generally very effective. It is best to remove the animals at once to a large barn or a number of sheds, and shut out all the light possible, but at the same time contrive to ensure the requisite air. This may be easily managed by improvising a number of narrow passages, constructed of tarpaulin, &c., and running at right angles with each other, for the purpose of ingress and egress on each side of the building. The next part of the proceedings is to feed on bran and sloppy food, in order to expedite the action of a moderate purge, which should be speedily given to each animal. The eyes may be bathed with a solution of Goulard's Extract, or sugar of lead, or, what is probably better, arnica lotion, several times a day. On the third day after the administration of the purge, powdered nitre, in the proportion of half a drachm to every pint of water allowed for drinking, will be found very useful at midday. Beyond this little else is required. The animals may be kept up probably a week or ten days; and if the hot weather subsides, rain falls, grass food becomes plentiful, and, moreover, if the sight is being rapidly restored, they may be gradually turned into the pasture again, not, however, without having secured ample shelter, to which they may resort in the event of any return of excessive sun and heat. The neighbourhood of a copse, an old building, or even a few hurdles packed with straw, so arranged that sheep may get beneath them, may avert serious consequences, and at this season should be highly esteemed for even a slight and temporary protection.

MEGRIMS IN HORSES.

Among equine animals the consequences of very hot weather are evident in an affection commonly known as Megrims, the nature of which has given rise to much dispute. This may probably have arisen from the fact that certain horses have shewn symptoms of the affection totally apart from the influence of hot weather; and thus neglecting to seek out and identify the legitimate cause, false conclusions have been admitted.

The disease exhibits peculiar phases. Young horses are no more exempt than old or middle-aged ones. The severest exertion is no more likely to cause it in one than the slightest movement in another. In one animal the seizures may be slight—so transient that they may nearly escape observation, while in another the most violent paroxysms are exhibited. We have seen a horse go along with every satisfaction for a few miles, then suddenly stop, stare about vacantly, and proceed again as if nothing had happened. The horse at other times may suddenly pull up, throw up the head and fall on his knees, as if shot. In more violent cases the animal suddenly rushes off at an alarming pace, heedless of everything, pull as we may at the reins, and the mad career is only brought to a close by some dangerous and probably expensive freak, such as jumping into a shop window or down an excavation, if it happen to be in the way. Happily, however, the mad freaks are usually of rare occurrence, and frequent notice of slight attacks induces the owner—wrongfully, we must state—to part from the animal, under the idea that "it is better to let some one have the trouble and risk with him." Megrims is a form of epilepsy, and owing to the various conditions which may give rise to it, the attacks are modified, and display such a want of connexion, that considerable latitude is allowed for speculation as to their relationship or identity.

Among harness horses a common cause is said to be a tight collar, or one too large, being drawn upwards by the false position of the points of attachment to the traces, which, causing pressure on the jugular vein, prevents the return of blood from the head. The modern view, and doubtless the more correct one, is that the pressure from a collar really prevents the circulation of blood *towards* the brain by the carotid arteries; and this is supported by the generally accepted idea of the real nature of epilepsy—an imperfect nutrition of the great nervous centre, the brain. Megrims does not usually affect harness horses with properly-fitting collars more frequently than those never used in harness at all; hence we must look farther for the cause. In animals that are subject to this affection it will be found that a very weak, and even slow circulation is present; there is also liability to congestion of the liver, and during any extra exertion the result may be obvious in slight *vertigo*, or, in accordance with conditions, it may merge into a paroxysm of uncontrollable fury.

Nothing in the way of surgery or medicine should be done for any attack of megrims. The owner must be deaf to every recommendation but one, that is, to take warning by the first attack and resolve to use the animal no longer until the causes are thoroughly ascertained, and proper medical treatment instituted. If the animal does not lose the power of standing, let him be led home at once; if he falls, have the head secured by sitting upon it until the attack is completely over and sensibility has returned, when he is to be taken home as speedily yet quietly as possible. Medical treatment consists of promoting proper action of the bowels, and thus reducing as well as dissipating congestion of the liver. The functions of the digestive organs must be afterwards encouraged by regular exercise, and want of general tone secured by the administration of various tonics and use of wholesome as well as easily digested food. If any faults are attached to the collar or harness, they must be remedied; and with the measures advocated little fear need be entertained of danger arising afterwards. It is only among those animals that are constitutionally wrong, and in whom improper food, idleness, irregular exercise, and probably needless drugging, singly or combined, work their baneful effects.

SEPTEMBER.

SORE THROAT IN HORSES.

With the decline of temperature common at this season, more especially if it is alternated with chilly winds, or frost during the night and powerful sun during the day, or continuous wet and cold weather, our domesticated animals are prone to certain maladies which prevail somewhat extensively in certain districts. Among horses, Sore Throat, or Laryngitis, as it is known in medical language, is most common.

With sore throat there is a cough, and at once known as the cough of sore throat by its frequency. The animal if at work stops suddenly, places the nose downwards, often between the knees, and there he will stand for some minutes, while the convulsive efforts as if to dislodge something are very rapid. short, and violent. As soon as they subside, he resumes his walk as if nothing has happened, but it is not long before another attack comes on, and they become so frequent that neither pleasure nor profit comes of using him. Sometimes the same intensity characterizes an attack which prevails in the stable, and when such is the case, the animal is usually at the worst when he eats or drinks. If the top of the windpipe is pressed gently between the finger and thumb, the fit of coughing may be produced at once, and by this proceeding many practitioners decide, after watching for certain other signs; but as a rule it may be dispensed with on the plan of avoiding unnecessary pain.

Besides the constant cough, there will be an increased redness of the membranes of the eyes and nostrils, and the mouth is hotter than natural, and if the animal has not lost his appetite, it is likely he has refused his oats and taken in preference his hay. We have frequently noticed this in the beginning of sore throat, as well as catarrhs and influenza with which sore throat is associated, the solution of which appears to be that, the muscles of the swallowing apparatus (larynx) being affected, they cannot grasp and pass on small particles of food, such as grain, which do not form with the saliva a solid bolus. Hay, on the contrary, after being masticated, is rolled up into a compact mass, and as such is carried to the back of the mouth, where it does not give way under the closing action of the muscles, whose office is to convey it to the gullet and thence to the stomach.

By aggravation of causes, sore throat does not always stop at the point we have described. Considerable swelling and pain takes place among the glands and muscles inwardly, behind the larynx and pharynx, and the large glands on each side outwardly participate. The animal goes off his feed, and he stands with drooping head and ears, while saliva flows continuously from the mouth, and he looks wretched and miserable. The presence of fever is shewn by great redness of the membranes, the mouth is intensely hot, breathing is rather difficult, and as the case proceeds there is a roaring or stertorous noise produced. Sometimes the swelling increases so rapidly that suffocation is apparent, and, to relieve the sufferer, the practitioner at once opens the windpipe, which affords a delightfully easy respiration. In these cases also an abscess may form inwardly at the back of the throat; and we have then analogous conditions to those in the human subject known as quinsy.

The treatment of sore throat in horses is very simple, and to effect a speedy and effectual cure, in the exercise of humanity towards the creature, some great mistakes are made.

Notwithstanding the great difficulty which is evident to all who see the suffering creature, some of the worst means of administering remedies are resorted to, such as cramming a bolus down the throat, or drawing up the head as high as possible, while a draught is poured down the mouth. In the latter case, the fluid being denied passage down the gullet may find its way into the windpipe: if it does so, it is a thousand to one if the animal is not choked. Seeing then these objections to such remedies, we recommend more simple and efficacious ones, such as the following:—If the animal is inclined to drink, and, as a rule, we find thirst present as a result of the fever, let him have water constantly beside him in which some nitre has been dissolved, 1 ounce of which may be put into a pail half filled. If he will take gruel or linseed tea, the nitre may be put in either, but on no account give more than 1 ounce the first day, or ½ an ounce during the second. The throat may be rubbed on the outside (commencing at the root of one ear, descending to the angle of the jaws, beneath and up the upper side to the root of the opposite ear), with ammonia, turpentine, or strong soap liniment. Mustard embrocation or liquid blister are sometimes used with benefit, but all require care, in order not to take off the hair.

In order to ease pain, the tincture of belladonna may be injected beneath the skin; chloral hydrate, and many other remedies may also be similarly employed; and to facilitate swallowing and lessen swelling in the throat, the mouth may be washed out frequently with a gargle composed of 2 ounces of tincture of catechu and 1 ounce of powdered alum, with about a pint of water. To use this it is simply necessary to elevate the animal's head so as to bring his mouth into a horizontal position, when a portion of the fluid, say a wineglassful, is poured from the bottle upon the tongue. The effect is to cause a movement of the jaws, by which the fluid is carried to all parts of the mouth, and thus comes into contact with those diseased. It is not necessary that this should be swallowed, therefore, after the jaws have been moved, the head may be lowered. It is, however, more effectual to make up a paste by heating the catechu in a small quantity of water, then adding 1 ounce of belladonna extract, 2 ounces of wheat-flour, and as much treacle as is sufficient to make the whole a semi-plastic mass, and a tablespoonful of it should be put on the tongue five or six times a day.

When an abscess is forming at the back of the throat, it is sometimes useful to apply the nosebag and steam the nostrils. A copious discharge from the lining membrane is thus produced, and the parts affected are lubricated, but if the breathing is in the least disturbed, this proceeding may be attended with danger. It should be arranged therefore to have the veterinary surgeon in attendance, in order, if required, to perform the operation of opening the windpipe. If this is done, the animal experiences little or no inconvenience afterwards; the maturation of the abscess proceeds, and discharge is effected without danger; but where due caution is not exercised, and the operation delayed, death frequently follows suddenly.

OCTOBER.

DISTEMPER IN DOGS.

Chorea is a very troublesome affection, and very rarely cured when allowed to remain too long. It consists of a continuous series of twitching or irregular contraction of the muscles, occasioned by a false or morbid condition of the nervous system.

Some animals are affected differently to others, indeed out of half-a-dozen patients we may observe as many varieties of the mode of attack. When it is in a mild form, the dog may exhibit periods of apparent freedom, but now and then as he stands, one portion or whole side of the body will be suddenly drawn downwards. The twitching may also be confined to one limb only or to both fore, when he appears to be constantly making a succession of bows. Likewise the neck or hind quarters are the principal locality of action, and corresponding jerking takes place.

Another dog is mostly affected when lying down, which causes him to be very uneasy, constantly changing his position and seeking fresh places. When the head and neck are affected, the former may be carried on one side, either drawn round to the right or left, or twisted so as to present one eye upwards and the other, of course, downwards. Again, the form assumes a peculiar trembling and shaking, which is as constant as it is singular, and in some dogs the twitchings are so rapid and violent as to cause the animal to shriek and howl from acute pain.

In each form there is a common tendency to degenerate into intractable states, when all kinds of treatment prove abortive, the creature loses flesh and becomes thin, weak, and attenuated, he can eat nothing, nor is he able to take rest a whole minute, and eventually dies of absolute starvation and exhaustion, from excessive fatigue. Chorea is otherwise known as St Vitus's dance.

Paralysis, or loss of power, is another of the awkward terminations of distemper. It may be considered as an aggravation of those conditions which give rise to chorea. While chorea may be estimated as a morbid condition of the nervous system, in which the supply of nervous energy to the muscular system is short, transient, and irregular—the principle by which the individual fibres of a muscle, or set of muscles, are kept under control, and caused to act in obedience to the will, is absent, and thus portions only contract, and so give rise to irregular movements, entirely independent of the will. Paralysis is a complete withdrawal of that power or principle, and the result is no movement whatever, and sometimes also loss of sensation entirely.

This may be due to congestion or softening of the brain, or some portion of the spinal cord; but whatever may be the immediate cause, the primary one appears to be loss of nutrition, occasioned by the impoverished state of the blood and other complications which supervene on neglected forms of distemper. Paralysis occasionally follows chorea in the early stages, but as a rule it appears unassociated with, and totally independent of it, not unfrequently coming on suddenly, and even when the dog has not given many signs of illness, or at least such as the ordinary observer would readily detect. At first the animal appears weak across the loins, and he staggers when walking. The hind quarters sway from side to side, and the hind legs cross each other. Weakness increases, the dog lies much and rises with extreme difficulty, and at length is unable to do so. As he attempts to get up, the hind legs make no effort; the spine is twisted, as it were, for while he may raise up the fore quarters and stand on the feet, the hind legs and hip lie flat on the ground, and in this condition the creature will drag along until the skin is rubbed off the surface, feet, and sides, giving rise to large and obstinate sores. Besides this the fæces and urine pass away without effort on the part of the dog, and unless scrupulous care is observed, there is additional cause for severe irritation of the skin, and great discomfort, from accumulations of noisome filth.

Surfeit.—By this is known a somewhat common form of disease which follows distemper. It is truly eczema, or a pustular eruption upon the skin, which shortly extends to every part of the body, forming large sores, having little or no disposition to heal, and giving rise to a sickly and offensive odour. The affected animal declines to move, as great stiffness is present as well as extreme pain and soreness, the appetite at first is absent, but after a time it is ravenous, yet all the food consumed does no good, the animal becomes thinner day by day, and weakness also increases, under which it eventually succumbs.

The treatment of these several states is an affair of great difficulty. It rarely happens that such conditions appear before much internal disorganization of structure has taken place; animals in these states may be said to be three parts dead already. Chorea, even in its mildest forms, seldom leaves the dog uninjured. He is more or less sickly, weak, and always under his work afterwards. In paralysis even worse conditions are present, and if he recovers from it he is so much the worse an invalid, that if he is shot at the first, it generally proves the most profitable as well as humane. The skin disease, doubtless, depends upon a vitiated state of the blood—indeed a blood poison, and this leaves about as much chance for recovery as the preceding diseases; nevertheless, there are favourite dogs and others of peculiar and valuable breeds, and owners are desirous that at least an attempt should be made to cure, however shadowy the result may appear. Under these circumstances many cases are taken in hand, and animals are carried through safely by means of unremitting attention and determination.

Among the list of remedies absolutely necessary, perfect quiet and absolute cleanliness are prominent, and in the way of medicine tonics are of great service. For chorea, quinine, iron, and nitrate of silver are usually given in small and repeated doses, being frequently alternated with each other. In paralysis, calomel and opium, or the blue pill with iron, answers very well, taking care to unload the bowels periodically by enemas and gentle aperients. In the skin affection, Fowler's solution of arsenic is the main remedy, while at various periods quinine and iron are essential. Lastly, if the animal will take food, it should be highly nutritious, given frequently in small quantity, and with as much variation and change as possible; it should not be allowed to remain within sight or smell, and always after being refused, removed from the presence of the patient

NOVEMBER.

DROPPING IN COWS.

There are several conditions which give rise to an inability to stand, or rise when lying, but which have been so commonly confounded with each other, that whenever a cow is said to have dropped at or about the time of calving, but one view is understood or expressed. She is said to have "milk fever," which term is also in general use with, and understood to be the same, as "the drop," "loin fallen," &c. However, by a study of causes as well as the nature and signs of the maladies themselves, veterinary practitioners are now able to distinguish three separate forms of disease which produce dropping at the time of parturition, each of which we will attempt to describe.

Nervous Debility.—This title is very expressive of the nature of the affection. The cow most likely to be affected is that which has not been very well kept, or, from other causes, is not in very strong and vigorous condition at the time of calving. We have frequently witnessed this form of disease in cows travelled about by dealers, and those farmers who keep theirs late on poor pastures without additional food, as hay or cake, in sufficient quantity, when, at the same time, they have milked largely and almost up to the time of calving. Previous diseases, as diarrhœa, debilitating colds, &c., overdriving, and all causes which tend to lower and reduce the vital powers are the means by which this affection is brought about.

Nervous debility is apparently due to functional disorder alone, as the usual course which it pursues, and almost entire absence of fatal tendency indicates. Cows that have had a bad time of calving are not necessarily victims, indeed, such are very rarely affected with this form of the drop. There is no fever, insensibility, nor wildness in the look of the animal, but the creature rests well in a natural position, and is as lively and attentive to all going on around as she can well be. The bag is soft. Milk is present in fair, or even large quantity, and readily withdrawn; the appetite is seldom affected, but constipation may be present to a slight extent, and the rumen is generally full, but not impacted. The pulse is tolerably full and soft, but the circulation is slower and weaker than usual, and the skin is cold. The ears and extremities also indicate the same want of tone and activity in the circulation. Large-bodied cows, and especially those that are heavy milkers, whose internal organs are also large, making a great demand upon the nervous system, together with those breeding from large bulls, are likely to be seized, if the general condition is suffered to fall below a requisite standard; hence we find this affection give way, on well-managed farms, to others, which we have yet to describe, having very fatal tendencies. Peculiarity of season, as long-continued wet and cold weather, may influence the production of the complaint, by causing a scarcity of grass, and thus the body deprived of a proper quantity of food, falls below the normal tone, and temperature is deficient; and these, in the end, impair the functions of assimilation, nutrition, and growth. A cow, when in calf, requires a very large increase of food, in order to provide suitable nourishment to the young animal; but if this be not supplied, her own body has, in a great measure, to supply it, and consequently, we find she becomes poor and weak, while the calf may be born healthy and well nourished, if the state of affairs be not allowed to go too far.

There is yet one particular which the owner may wisely bear in mind as a remarkable feature of the disease, and by which he may readily distinguish it from all other affections happening at paturition. The cow can suckle the calf well, and cannot bear it out of her sight, and all general appearances favour the assumption that nothing at all is the matter with her except her inability to rise. In other forms of dropping after calving, as we shall hereafter point out, no such peculiarity as this exists. It is therefore valuable as a distinctive sign of parturient nervous debility.

We have now to notice the means usually employed in order to bring about a return of that nervous tone and muscular power. If the stomach be heavily loaded, and more especially if the bowels be also constipated, it is necessary to give a little opening medicine, but active purgation must be avoided, or the animal may be rendered weaker than she is. Let us suppose for an ordinary dose, we should give the cow 1½ lb. of Epsom or Glauber salts. In the case we are describing we should recommend that only 1 lb. be given, that is, reducing the ordinary dose one-third. With this should be combined 2 ounces of ground ginger, and the same quantity of ground gentian or colombo, and 2 lb. of treacle, the whole being mixed with 2 quarts of warm water, having a handful of flour thrown into it and well stirred.

In drenching the animal care must be exercised. The head must not be held too high; the fluid must not be poured too rapidly or in large quantity down the mouth. Do not hold the tongue, but allow it free liberty, and give her ample time to swallow each draught before another is administered. The next thing to be done is to give an injection of warm soap and water. It should not be higher than 100 deg. Fah., and not more than 1 quart given at once, but repeated every two or three hours until the bowels are proved to be responding. Small clysters are best, as they do not promote discomfort as large quantities of fluids are apt to do.

Further medicines are not required for at least eight hours, therefore we would recommend that the calf be allowed to draw the udder regularly, or, if inconvenient, milking by hand must be resorted to frequently, say four or five times in the day. This is also important, as nothing disturbs the cow so much as having milk, and being unable to discharge it after having accumulated. In the meantime, also, warm rugs may be put over her back, or in their absence dry sacks will answer the same purpose, and these should extend upwards over the neck; afterwards straw may be heaped over her, and in this way resting with only the head visible she will become warm and comfortable. Some practitioners follow the plan of passing heated smoothing irons over a cloth placed longitudinally on the spine. We have tried this also with marked benefit, and gladly recommend it to our readers. The object is to promote warmth and circulation in the neighbourhood of the spine, and so nourish the nervous system in that locality.

Subsequent medicines are sweet spirits of nitre, 1 ounce; ground gentian, ginger, or colombo, of each 1 ounce; tepid water, 1 pint. This may be given three or four times a day. The food must be light and nutritious, consisting of scalded oats or barley, malt mashes, green clover, grass, roots, &c., as they can be obtained, and these must be supplied frequently and in small quantities at once. If she refuse any portion, it should be taken from her sight and not offered to her a second time.

Cows in this affection recover at variable times. In some cases they are down but a few hours, but if remedial measures are delayed, a day or two may elapse before the cow rises. As in all other complaints, early treatment in this is most successful.

Puerperal Fever.—The second form which occasions dropping at calving is named "puerperal fever;" it is the true "milk fever" of cows, and is likewise known as "puerperal peritonitis," and "metro-peritonitis," terms which are of greater use to the medical man than to the proprietor of stock. We shall continue to use the term "milk fever" throughout this article, not only for the sake of ease and simplicity in description, but also for clearly defining the differences between this and other forms of dropping at calving.

Milk fever is generally seen among cows that have had a difficult time in calving. When the calf is large, pains are strong, much force used, and many hours are occupied in delivery. During such cases there is much opportunity for damage in the walls of the womb by extraordinary efforts to expel the calf; inflammation of the blood-vessels follows—phlebitis, together with the various tissues of the organ, which is of the nature of erysipelas. The covering of the womb—peritoneum, an extension of the same membrane which lines the abdomen throughout, as well as forms a complete investment for the intestines and all other organs of the abdomen, likewise partakes of the same disease, and this extends, more or less, frequently proving fatal to the animal.

When the membranes—placenta, happen to be retained too long after calving, they are likely to give rise to milk fever; decomposition taking place, the dead and putrid elements are absorbed by the mucous surfaces of the womb, and thus a poison is carried into the blood vessels. Sometimes the discharges from the uterus may be re-absorbed and produce this; such discharges, we wish to point out, as are the result of morbid action, itself the offspring of the effects of difficult labour.

Cows of all ages are liable to it; over-driving and exposure, together with bad feeding and management are fruitful causes, as engendering a state of system in which erysipelas is most readily produced.

The signs of milk-fever are very remarkable, and when once accurately noted, may be easily remembered. It rarely appears before calving, but mostly appears soon after, and the fatality or mildness of the disease may generally be estimated by the time at which the animal first appears to be attacked. Early cases are generally the most severe, of longest duration, and most fatal; the longer the cow remains free from the attack the more likely she is to have the disease in a mild form and recover early. The usual course is for the signs to appear within a few hours after delivery, but many cases are delayed even until the third and fourth day. In the first instance, the signs rapidly follow each other; in the latter, they are slow and gradual, and seldom gather the intensity to be seen in the first.

The early symptoms are defective appetite rumination has ceased, and the milk has diminished largely. The cow is restless, and wanders about, moaning plaintively. There is evidence of fever, as cold legs, hot mouth, and increased temperature at the roots of the horns. If the thermometer be passed up the rectum, an increase of animal heat is shewn by it also. Pains begin in the abdomen, and the cow switches her tail, stamps, and kicks at the belly with the hind legs. She turns the nose frequently to one of the flanks, moans and tries to lie, but evidently does this as carefully as possible, often remaining some time on the knees before finally settling down. When she rises the same pecularity may also be noticed. As the case proceeds, pain becomes more constant and acute; the bowels are confined, the pulse is rapid, and possesses no volume, but is small and thin—like a wire beneath the finger; the paunch swells from the formation of gas inside, and the cow strains violently; the head is thrown from side to side, and shortly she becomes insensible, when death speedily follows.

After death we may observe the uterus is inflamed throughout its structure, and besides large quantities of straw-coloured material being present, pus is not unfrequently found, with here and there large patches of dark red, purple, or even black patches, and a chocolate-coloured fluid, sometimes in tolerable quantity, inside. The same conditions apply to some other organs of the abdomen, and the brain is found to be congested, as a result of the blood poison engendered late in the stages of disease.

In the treatment of the disease great reliance is to be placed on *early bleeding* and *purgation;* but this must be regulated entirely by the state of the pulse. If insensibility have set in, and the volume of the artery is small, beats weak and rapid, no good is to be effected by bleeding; it will only then hasten death. When the artery is full and the pulse is beating hard and vigorously, then we may bleed and purge with advantage. The quantity taken must not be regulated by the size of the beast, but by the pulse. While the blood flows the finger should be on the artery, and, waiting for the first signs of diminution and weakness, the operator should be occupied by nothing else, that he may be ready to close the wound and prevent fainting.

The purge should be a brisk one, an extra quantity of salts being employed, say one-half or two-thirds more than for a mild dose, with which 2 or 3 ounces of ginger and 2 lb. of treacle should be mixed, and the whole washed carefully down with at least 3 quarts of warmed ale. Injections of soap and water are to be given every thirty minutes to promote the action of the salts, and the skin should be sponged with tepid water, and three or four men set to work to wisp it down with soft haybands until proper warmth and circulation are established, after which the animal may be left for two or three hours covered with sacks and straw heaped over her body.

By this time a veterinary surgeon has probably been called, who will conduct the future treatment of the case; but if such assistance be not forthcoming, we may advise the following draught:—Acetate of ammonia, 4 ounces; nitric ether, 1 ounce; tincture of aconite, 30 drops. Great care, however, is required in the future use of this remedy, as awkward results are not uncommon in the hands of strangers to medicine. It will be safer to omit the aconite, and persevere with the acetate of ammonia and nitric ether every four hours, until the pulse becomes slower and fuller, which, together with the return of circulation, warmth, and usual cheerfulness, may be estimated as very favourable signs.

When it so happens that blood-letting is not admissible at the outset, the purge should be given only, the rest of the treatment as detailed being carried out; and when insensibility has set in, the medicine must be passed down the gullet by means of the probang or stomach pump, as any other means will choke the cow at once.

When pain is severe and constant, some relief may be obtained by injecting various fluids beneath the skin, as tincture of belladonna, chloral hydrate, &c.; indeed, this promises to become one of the most useful branches of practice, and by which greater results follow than by any other known method.

Apoplexy of Parturition.—The third form of disease to which cows are liable at the time of calving is known as parturient apoplexy, or parturition fever. It is an affection totally different from the two preceding kinds which we have already described, in no point whatever agreeing with them, and therefore, should not, as is too frequently the case, be mistaken for one of them.

The points of difference most to be relied upon are as follows:—It never attacks cows in lean or poor condition that are bad milkers, but is common among those that are prone to lay on flesh rapidly, regardless of breed, and more especially if they are heavy milkers. At one time it was thought that cows of the most improved breeds were only the subjects of the malady, but later investigations have decided that as among them are many that are worthless for the dairy, the supposition is groundless. With regard to age, heifers at the first and second times of calving do not suffer from this kind of fever. It appears that the system must have reached a stage of almost completion in development before it is liable to it, therefore, we find that cows suffer most at the third and later periods of parturition; and it is also a fact worthy of note, that when an animal has once been affected and recovered, she is likely to have a second attack at the next parturition, and that is almost sure to prove fatal; in fact, the average losses from attacks of parturition apoplexy are not less than 95 per cent.

It is also remarkable that this disease does not follow abortion, premature labour, flooding from the womb, retention of the afterbirth, or when the process of calving has been preternaturally long, difficult, and tedious; all of which, it appears, being causes which operate strongly in limiting the tendency to it. Parturition apoplexy is undoubtedly a blood disease, partaking of the same nature and characters as "black-leg" and various other forms of blood affections, which have already met with some notice in these pages. It is due to high feeding, especially when the practice is attended with close confinement, and still more so when the cow is naturally a heavy feeder and milker, and likely to make much blood. Easy-tempered, docile animals, and those that will make flesh even on poor kinds of food are favourable subjects. It is reasonable to suppose that as long as such an animal has inside her a large growing calf, demanding much nourishment for its flesh, bones, and numerous organs, the system of the mother knows no inconvenience; but vital processes once fully established are not suppressed in a short time, and the various organs cannot rapidly accommodate themselves to sudden changes: it, therefore, happens that, as soon as the calf has reached the stage necessary for its expulsion, and no longer makes such demands upon the mother, the large supply having not diminished, the whole of the organs are flushed with blood highly charged with rich materials, and the brain being foremost among the sufferers, its vessels often give way and burst, and death inevitably follows after some hours of extreme violence, during which the creature is unconscious.

The victims of this affection are not unusually atttacked and even die before calving, in which case it is severe, and seldom extends over 36 hours from the first-observed sign. Generally many hours proceed before the owner or attendant discovers anything wrong, and in this way much mischief is made, when at length the cow becomes excited, the eyes are staring, and she shakes her head frequently; if she walks she appears weak, and staggers as if the loins were at fault, and shortly the hind legs double beneath her weight, and she falls awkwardly to the ground, having no power to put herself into a natural or comfortable position. All other signs now come on in very quick succession. The eyes are bloodshot, and blindness follows, and the head is thrown from side to side with such violence as to cause the horns to slough, and sometimes to fracture also the bones within; and thus affairs go on for twelve hours or more, weakness becoming greater, and death taking place sometimes suddenly from suffocation. After death the windpipe is often found full of half-digested food, which has passed up the gullet to the mouth, partially as a result of pressure and probable withdrawal of nervous power, and during the heavy inspirations is drawn towards the lungs. The third stomach is also full of hard masses of food, and the bowels are more or less involved. The brain is heavily charged with blood, and frequently large quantities of clot are found at its base, extending to the spinal cord. The bladder is full of urine, and sometimes bursts under the pressure and large quantity; it should, therefore, always be the practice to empty the organ by artificial means as soon as the cow is down, and also frequently afterwards, that such an event may be avoided.

The cure of parturition apoplexy is a most uncertain affair, except in those instances where a practitioner happens to see the animal before she is down, and, having discovered the first signs, while the pulse is full and strong, he abstracts blood largely, and succeeds in moving the bowels by purgatives.

It is of no use trying homœopathic measures here, a dose and a half, at least, of medicine, should be given, salts forming the basis, with which a few drops of croton oil and 2 or 3 ounces of ginger and treacle, as already detailed, are added.

Clysters of warm soap and water are of the utmost importance, and should be used every half-hour until the bowels are moved. The body requires warmth, and it is well to apply smart friction after the skin has been sponged with tepid water. In giving the medicine, the same care is required as in milk-fever to avoid choking, and as soon as any indications of insensibility are evident, stomach-pump or probang must be used instead of the bottle.

After a full purgative dose has been given and other details are carried out, such as making the animal as comfortable as circumstances permit, she may be left in the care of an attendant for a couple of hours, at the end of which 2 ounces of sal-volatile spirits may be given in 1 quart of cold ale, in which an ounce of ground ginger is stirred. This dose may be given every four hours until the animal either recovers, or shews indications of no improvement or rapidly increasing weakness and insensibility. Repeated bleeding is not at all a wise proceeding; if the first large abstraction has not reduced the tendency to apoplexy, a second will only hasten death: the only possible good that can be obtained is by the use of the stimulant already named.

DECEMBER.

THRUSH IN HORSES.

By this term is commonly indicated a dark-coloured or black and offensive discharge of fluid of variable consistency from the frog. In some localities it is called trush, running thrush, &c., and many carters and draymen use the expressive though inelegant term, "rotten frog." The condition in which the several parts are observed, when suffering from the disease in question, is somewhat as follows:—The cleft of the frog, *i.e.*, the triangular fissure extending from about its centre, backwards to the heel, is deep, open, ragged, soft, spongy, and tender. If the finger is inserted with moderate pressure, it may be caused to penetrate beneath the horny frog, portions of which may be raised from the sensitive surfaces beneath; and when withdrawn, the odour imparted to the finger is most offensive and characteristic of decomposing bony matter. Usually, simple thrush consists of a mere crack, through which the discharge flows irregularly, but as described already, it is of an advanced stage; and beyond this a third variety consists of disintegration of the whole of the horny frog, with burrowing of matter beneath the horny sole, and considerable lameness. The disease originates in the secretory organs of the sensible or fibrous and fatty frog, and this prevents the formation of sound horn for a covering, the whole process becoming eventually one analogous to that of sloughing of soft parts, in which more or less solution or decomposition of horn takes place, and gives the characteristic odour of the disease.

The causes of the disease are various, viz., presence of moisture, together with such matters in solution which have a softening and solvent action upon the hoof; irritating substances acting upon the exposed sensitive structures, and malpractices in shoeing which tend to remove the frog from exercise of its natural functions. We will consider these in the order given. The prevalence of thrush among colts and horses turned upon wet pastures and into straw yards standing in much moisture, is well known. The softening effect of water is acknowledged by all who deal with their feet, as is proved by the ignorant groom and farrier who make use of stopping, &c., that the process of paring may be more easily accomplished. Practical test, however, fully supports scientific conclusions in reference to this point; hence we accept without doubt, that, in order to preserve hoofs in a state of soundness, and in their best capacity as a protection and weight bearers, they are best preserved in a state of dryness and hardness as much as possible. Water softens the hoofs and destroys their physical properties, and thus they fail in their offices. But the conditions are still worse when water or moisture, to which they are exposed, contains such ingredients as possess a solvent power on the hoof; therefore, we always observe that horses turned to grass for any time, or into wet straw yards, come up with diseased frogs, or thrushes. The reason is obvious. The moisture and wet of these places contain a great amount of saline matter in solution, as ammonia, potash, and soda, and these act powerfully upon horny substances. In order to test this fact, let our readers make a solution of soda or potash in water, and put in a broken horn comb, or portions of an animal's hoof or horn, when they will find after a few days, in accordance with the strength of the solution, that the substance becomes soft and gelatinous. The same effect is produced when horse or cow dung is used as a stopping, and also when the animal is allowed to stand in his own manure.

The secondary effects of these substances are those of irritation, for as the frog is softened, it becomes more porous, and absorption more complete; and when decomposing matters surround the foot, they act powerfully upon the sensitive parts which eventually are exposed; besides, sand, grit, and other solid substances also find their way through the various openings, and become mechanical agents of disturbance.

The third cause of thrush is the use of high-heeled shoes, allowing the horny heels to become too high, and paring away the frog, all of which faithfully remove the organ from the great pressure which, as a natural cushion, it is intended by Nature to bear continually. Loss of function, or idleness and inactivity on the part of any organ brings on disorder, and that state only precedes disease. In this condition, moisture and alkaline solutions, as the water of straw yards and ponds into which drain the manure of the farm, only are needed to make the frogs as bad as they possibly can be; and when such are continually applied, together with bad management, generally in feeding, &c., we may expect to see the disease extend upwards to the legs, giving rise to complicated states. The whole foot becomes involved, first the soft, and secondly the hard parts, and the disease becomes *canker;* as it goes up the leg, the skin exhibits the principal signs in the shape of swellings and pustules, and confirmed *grease* is the result.

Thrushes do not produce lameness in their simplest states, but the frog is tender, and the animal will wince under pressure from the pincers, or when the part comes upon a loose stone on the road. When they become aggravated, decided lameness follows; and although it may appear insufficient to call for absolute rest, there is nevertheless great pain and inconvenience, and the process of cure is much facilitated by its being carried on in conjunction with cessation from work, at least until considerable improvement is made and tenderness removed, when pressure and contact with the ground is productive of great good.

When the disease is limited in simple thrush to a single crack or opening in the cleft of the frog, the course is very plain. First, clear out the dirt carefully with the *back* of the knife, and pack moderately tight into the fissure some tow saturated with the following mixture:—Sulphate of zinc, one part; and acetate (or the sugar) of lead, one part. These are to be reduced to powder and put into a small dish or cup, and covered with either sulphuric, nitric, or hydrochloric acid. A mixture of the first and second appear to be most useful and powerful. Usually one or two dressings are sufficient, but if needed, they may be repeated once in three days, the old tow being removed each time. In severe cases the ragged portions of horn may be detached before the dressing is applied, and it may be advisable to dilute it with one-fourth of water, especially when the sensitive frog is exposed. If matter has burrowed, horn must be taken away to the full extent, and poultices applied for a day or two. In addition, a dose of purgative medicine will be of great service.

QUITTOR.

The disease which we are about to describe under the above name, is principally confined to the heavier breeds of horses, and prevails to a great extent during the winter time, than at any other season of the year. Quittor consists of wound in the coronet, or band of flesh immediately above the hoof, which from the nature of the surrounding parts, having a tendency to assume a chronic or long-standing condition, exhibits an unhealthy appearance, and by means of so many sinuses or pipes, discharges matter of variable consistency. The causes of quittor are pricks in shoeing, treads from the opposite foot or feet of other horses, bruises, &c.; but the most common cause is the infliction of a wound by the sharpened heels of the shoe in frosty weather, when men are not sufficiently careful in turning or backing the animals.

From whatever cause quittor arises, there is always, in the first place, great swelling and hardness, and this condition of inflammation proceeds for some time without any definite signs of dissipation, while the animal becomes unable to set the foot to the ground. During this protracted and unsatisfactory stage, there is much damage going on. There is no tendency for inflammation to localize itself and be confined to the coronet or top of the hoof, but, on the contrary, it spreads throughout a large space among the tissues of the foot, destroying much of them, and by the time that matter or discharge issues from the coronet, there are a dozen different sinuses or pipes leading to the outer opening.

Nor is this all: in addition to the destruction of the soft parts, the hoof and bone are doubtless involved. The latter takes upon itself a species of extra production, and on the surface of the part affected within, there grows a large tumour, which, on account of the space it occupies, invades the substance of the coffin-bone, and gives rise to a corresponding depression. The cure of quittor may proceed and apparently end well, but at some distant day this horn tumour produces inconvenience, and may even render the animal useless.

When horses are being shod, more particularly sharpened or "roughed," in winter, the haste with which the work is usually accomplished forbids the exercise of so much care as the importance of the operation and value of the animal imperatively calls for. Nails will sometimes bend, or "kink," as the farrier has it, after they are partially driven, and thus the bulging part presses severely upon the internal sensitive structures. The same also takes place when nails pass in too close proximity to the same tissues. At another time an old stump is left in a former nail passage within the hoof, and when a fresh nail is driven by the farrier it may pass, of course without his knowledge, between the stump and sensible parts, and thus produce unbearable pressure. An old stump left within the hoof may likewise direct a fresh nail at once towards the inside, and so prick or wound important parts. Sometimes it is withdrawn, and driven again; or, after wounding the sensitive structures, passes outwards, and in each case, no suspicion having been aroused at the time, the animal goes to work, when shortly he becomes lame, and if the cause is not found at once, the result is great pain and inflammation, succeeded by the formation of matter, which, if not liberated from below, finds its way, by accumulation, and destruction of tissue, to the top, when it is discharged from a number of pipes, which converge into one or more openings as the case may be.

The cure of quittor is variable: it entirely depends upon the stage at which it is commenced, and the amount of damage already done to the parts. Sometimes the bones and lateral cartilages, as well as the coffin points, are so diseased, that if the animal is treated, although the quittor disappears, either ringbone or sidebone appears, and eventually renders the animal useless. If the case is seen as soon as the wound has been inflicted, little more than a poultice and cooling medicine is required. If the coronet has been cut and bruised by the pointed heel of a shoe, carbolic acid dressing is a most valuable remedy, as by it the tendency to form matter is arrested, and possibly the animal may go to work again in a day or two.

If the animal has been pricked, or bound by a nail, the offending agent must be at once extracted, and accumulations of matter evacuated from the edge of the sole of the foot.

The quittor, arising from a cut or bruise at the top, is essentially of the same character as that caused by suppuration from nails or corns, &c., and when the sinuses are fairly traced in all their directions, it is good practice to open them up from their very bottom, by means of a surgical knife known as a bistouri. Veterinary practitioners usually furnish themselves with different kinds of these instruments, the best of which, the bistouri caché, being formed not unlike a pair of scissors, is so constructed that when it passes to the bottom of a sinus, by pressure upon the handles, a blade is exposed, and in withdrawing it the sinus is cut open from one end to the other. This procedure stimulates the parts to healthy healing action. Another plan is to eat out the sinuses by caustics. This consists of passing solid arsenic or corrosive sublimate down the passage and binding a poultice over the foot. If care is exercised, the animal may do well, but there is danger of injuring the joint. Some practitioners pass a pointed piece of iron, at a white heat, through the parts, and when properly managed, rapid cure is frequently effected. A more cleanly remedy is the injection of a solution (1 part to 8) of corrosive sublimate into the wound, and using an astringent lotion afterwards. In all cases, the animal should rest during the severe stages of quittor, and pressure must be taken from the parts by the application of a bar-shoe.

TETANUS OR LOCKED JAW.

Those diseases generally fatal to mankind are also likely to be fatal to the horse. In fact, all diseases affecting the nervous system are more to be dreaded than any other species. Tetanus is by no means confined to the jaws alone; the locking of these is merely the result of the tetanic affection, and is termed Trismus.

Tetanus is a universal spasm, producing rigidity, and every portion of the system partakes of the disease, but particularly so do the bowels, the muscles, and the brain. This disease, so awful in itself and so dreadful in its termination, is sometimes caused by long exposure to cold, or standing tied up in a stall with the rain coming down on to him through the roof; by a severe blow of a stick on the backbone or head; by being pricked by the smith when shoeing, but most frequently by the horse gathering a nail or a piece of glass in his foot, and indeed often by the subsequent treatment for these injuries, no doubt pursued with the best intentions. We now allude to the common practice of pouring into the wound powerful astringents, such as nitric or muriatic acid. We cannot sufficiently deprecate the use of these agents when thus made use of, and are surprised at any horse on which they are used, escaping serious injury.

The horse will invariably, says Mr Swift in the *Western Farm Journal*, shew tetanic symptoms twelve or twenty-four hours previous to the jaws becoming set, and if he is properly attended to, at this stage, the fatal event may be averted. The symptoms of tetanus are, wild and frightened look, limbs proppy and inclined to spraddle, the tail stiffened, and, like the head, stuck outwards; the nostrils will be distended, the pulse irregular, and, owing to abdominal derangement, the bowels are highly costive.

You must now find out the cause of all this trouble; if it be a prick of a nail or any other punctured wound, or a stone bruise (now bear in mind the disease may set in after the lapse of a month or six weeks from the time of injury), then dilate the wound or open the bruised part and give vent to any matter that may have formed. Poultice the part continually for three or four days; administer an active purgative, such as calomel, if your patient be plethoric, but not otherwise; keep him comfortably housed, and allow no one to approach him except the one in the habit of caring for and feeding him. This person should carry out the instructions as to the subsequent medical treatment, which must be of such a nature as to soothe and quiet the nervous system. If the horse be a valuable one and worth the expense of the medicines, you may give once a day 3 to 4 grains of atropia mixed with a little honey, on the tongue, also 10 to 18 drops of hydrocyanic acid, morning and night; let the patient have anything to eat that he will; let him have continually before him some bran or hay tea, and some nice sweet hay. It is well to keep him nibbling. And now we must turn our attention to supporting nature in an artificial manner; this we may assist in by giving nourishing clysters three times daily, composed of strong beef tea, oatmeal gruel and boiled flax seed, and every second day throw up the bowels a quart of linseed oil. This will tend to relax the bowels.

You will now wait patiently ten or twelve days, and if the horse survive that time, you may begin to calculate on his recovery; but whilst the rigidity of the muscles prevails you must still attend strictly to the above mentioned régime. When you perceive a marked change for the better, leave off the atropia, as it is so expensive, and substitute a dose of hydrocyanic acid.

Presuming that your patient convalesces, it will be some considerable time before he can, with safety, be returned to his former work, as his constitution must be shattered, and he will be more susceptible to other diseases, so we should recommend at least eight to ten weeks' quiet rest, with liberal food and tonic medicines.

CANKER OR CANCER OF THE FOOT.

There is probably no disease to which the horse is liable, that presents such obstinacy and intractability as canker, or cancer as it is sometimes named. At the same time, there is scarcely one which proves more annoying and disgusting; but fortunately such cases are now rare in comparison with their prevalence twenty years ago. This much for improved breeding, but more for improved management; and now we trace the origin of canker almost in every instance to neglect and ill-treatment among the horses of poor and wretched owners, who house their animals in any out-of-the-way place.

Whatever may be cited as the principal and most predisposing causes, we cannot name any more powerful than the prevalence of filth, want of ventilation, and general bad treatment of horses of low, coarse breed, among whom canker is most common. Occasionally, however, the disease has excited no small degree of surprise by its appearance in one or more feet—generally the hind—of a well-fed and cared for, as well as better bred, animal; but usually the cause in the end is discovered to arise in some defect in constitution, while attendant gross carelessness somewhere characterizes the stable routine. Some owners, and also carters, or horsekeepers, are peculiarly susceptible of these cases. We well remember a man whose occupation was that of a carrier, and who, frequently putting his horses into different stables on his way, was almost continually annoyed by grease or canker among them. Some went so far as to assert that contagion alone developed the consequences, and when he sought to avoid them by changing his horses, he proved no less free. At length he gave up his travelling life, and settled down to work in his native town, after having sold his stock for horses of a different kind. Then the care of them came more immediately under his own eye, and with that canker and grease disappeared from his stables altogether.

Sometimes when, after an injury has been inflicted on one foot, filth is allowed to prevail, canker will ensue and be confined to that foot; but as a general rule, more than one are affected at the same time. From various causes the hind feet are the most liable, as the legs are, to a variety of diseases rarely seen in the fore, and in this way bad constitution appears to have some part in the cause, while we know also that a weakened circulation exists in these parts, and wet, dirt, and filth have therefore more powerful influences.

In ordinary cases, canker commences at or near the frog, and shortly spreads over the whole surface of the sole. In other instances the sole, or sensible laminæ beneath the wall, are the parts first affected; but wherever the origin is, but little time elapses before the whole under-surface of the foot is involved in one mass of spongy, soft, and offensive fungus, which grows as fast almost as it is cropped off, and discharges a black fluid, having the characteristic odour of absolute rottenness, which will not leave the hands after repeated washings: indeed, horses with canker may be detected many yards off, so powerful is the odour which escapes from the diseased parts. This odour is even given off from apparently healthy feet of horses, whose constitution is predisposed to canker; and it has been observed repeatedly that such animals need only the contact of filth, and to be neglected in feeding and other matters, to ensure the appearance of the disease. Another peculiarity consists in the fungoid growth being highly charged with blood, so that on the application of the knife, or if the parts are roughly handled or bruised, a free and copious hæmorrhage will take place, and materially interfere with all curative operations. Such cases when neglected always end fatally, as constant absorption of the secreted matter from the diseased parts eventually creates a blood poison, and the animal then succumbs from putrid disease.

In the treatment of canker the greatest patience and perseverance are needed. For a time the foot or feet appear to improve very nicely, the fungus disappears, and horn comes up apparently dry and sound; but suddenly when the parts are exposed, a fresh place has broken out, and shortly the whole sole is again involved. On this account it is not safe policy to rely solely upon one remedy or kind of dressing, and many practitioners have always several made up at once, so that this rule may be more strictly observed. The frequency of dressing is another feature which requires attention: the dressings should be renewed daily, if possible, for a time, seldom being delayed beyond two days, and great care is to be observed in avoiding wet and dirt. The parts are already in an engorged condition, or swollen from internal pressure of fluid, as well as enlarged from excess of nutrition; dryness is therefore needed to counteract the existing conditions. Some practitioners recommend the whole of the horny sole, and even portions of the wall, to be removed when canker has appeared beneath either. This is a painful operation, and should not be decided upon until the whole case has been gravely considered. After such removal it is usual to dress the raw surface with some caustic, as nitrate of silver, strong acids, or the mixture as recommended for thrush (*ut supra*), dry tow being carefully packed over the whole, in order to ensure protection, and at the same time moderate pressure. In the mode of packing up the foot so as to ensure pressure, some tact is required, and when nicely accomplished, the benefit which is derived is so singular and wonderful, that many rely upon it before any other remedy.

When the fungus growths are large and extensive, they must be frequently cut down, and strong caustics afterwards applied. Of the latter, no particular reliance must be placed upon any one in particular. Nitric, hydrochloric, and sulphuric acids are all useful; likewise the perchloride of iron, butyr of antimony, &c.; but the secret of success rests in their frequently being changed, oft repeated, and perseveringly applied; yet much caution is needed in order to guard against wholesale sloughing, with eventual disease of the bones, as well as the production of irritative fever which may kill the sufferer.

As the disease really depends upon a peculiar state of the constitution, hope of cure must not be placed upon outward dressings alone. There are various organs which, if kept in healthy action, may be caused to eliminate from the system much that aggravates the original disease. For this purpose, therefore, occasional purgatives and diuretics will be required, while tonics—particularly the sulphate or carbonate of iron—may be used in the interval by which the strength and tone of the system may be promoted and kept up. In the use of these several remedies, no particular rule can be laid down. The person who undertakes the care and cure of canker in the foot of the horse, must be content to suffer many failures and much discomfiture. His reward will only result from patience, perseverance, and considerable tact in selecting the various agents at the most suitable times.

RAT TAILS IN HORSES AND CATTLE.

Among the many forms of inflammation of the skin covering the legs of horses and cattle, that commonly known by the above title is probably not the least troublesome. "Rat tails" is a chronic affection, probably commencing, and being for some time confined entirely to the bends of the knees and hocks; but, owing to neglect in treatment, constant exposure to the action of cold, wet, together with irritating mud, &c., the whole of the legs partake of the inflammation, and eventually large cracks form across the legs upon each side, communicating with each other behind. The hair grows stiff and strong, standing erect from the legs, and presented in every conceivable direction. The legs become one mass of fissures, from which ooze a discharge of variable consistency, and by coagulation or hardening tends to create a fresh irritation.

As the disease proceeds, the hairs are matted together in large tufts, and these presenting the forms of tails, have suggested the term now in general use. The edges likewise of the fissures enlarge and become hard, rough, and scaly; great irritation prevails, and the animal, in its endeavour to allay it, rubs the limb against the gate or post; this not unfrequently giving rise to hæmorrhage and causing further aggravation. We have seen cattle turned upon cold wet limestone and clay pastures very liable to this disease, but horses are by far the greater sufferers, by reason of the more frequent extreme changes to which they are exposed. Wherever the disease appears, the affected animal suffers from great stiffness, often also from severe pain, and these combined tend to interfere with the general functions of the system so much as to produce what is known as sympathetic fever, when considerable skill in medical treatment is required, as well as exemplary domestic management.

In ordinary cases, the general plan of medical treatment is simple, but the owner must be prepared to exercise much patience, as this form of disease not uncommonly lasts a long time. The procedure in all instances rightly commences by acting moderately on the bowels by a dose of aperient or opening medicine, during the operation of which the animal should have careful attention, particularly in winter time. Cattle suffering from the disease, when put under treatment as recommended, should be driven up to the straw yard, where they can have the comfort of a shed and plenty of straw; horses may be kept in the stable or a loose box, and the body should have some warm covering until the bowels have resumed their natural action.

Some days will be required to effect this, and at the end, a course of medicine is to follow in regular and repeated doses daily. The medicines suitable are the carbonates of soda and potass, liquor potassæ, and the acetate of potash, all of which may be dissolved in the drinking water, or the three first may be mixed with the food. The liquor potassæ, however, requires first diluting in ½ pint or 1 pint of water, when meal or bran may be used to absorb the whole and enable the attendant to make a more perfect mixture with the general food. Of these remedies, the following dose may be given:—Carbonate of soda or potash, 1 ounce morning and night; liquor potassæ, ½ a fluid drachm, also morning and night; acetate of potash, 1 ounce at the same hours.

As a local or outward application, the best that can be used at first is a dilute solution of liquor potassæ, consisting of about 1 drachm to a pint of water, with which 1 ounce of glycerine and 1 ounce of laudanum have been added.

THE VILLA GARDENER.

Conducted by W. EARLEY, Ilford, Essex.

THIS Magazine is not intended for Professional Gardeners, who are already so well supplied with ably conducted weekly and monthly journals, but for that very large class—the dwellers in Suburban Residences and Villas—who are interested in Gardening simply as a relaxation from other pursuits, who do not employ a regular gardener, and who have no Periodical devoted expressly to their interests.

The pages of The Villa Gardener are occupied with matter concerning VILLA and TOWN GARDENS—to their laying out, planting, and general culture—the management of plants in the open air, the Conservatory, Greenhouse, Dwelling-house, Balcony, Wardian Case, &c. City Gardens, Squares, Parks, and places of public resort, receive also some degree of attention proportionate to the influence they exercise, or may be made to exercise, on the public taste.

Special articles by some of the most competent writers of the day appear regularly on all Gardening operations—as the Preparation of the Soil, Manuring, the Sowing of Seed, Striking Plants from Cuttings, Grafting, Layering, Pruning, Training, Watering, and the innumerable other operations which require to be performed in the course of the year, even in the smallest Garden. The Conductors have also something to say on the best mode of dealing with the Pests of the Garden—Insects especially.

Notices of New Flowers, Fruits, Ornamental Plants and Trees, and Culinary Vegetables, so far as these may be interesting to Amateurs, appear in each Number, and their respective merits or demerits are fairly criticized.

Particular attention is given to the construction of Conservatories, Greenhouses, Stoves, and Hothouses, and of the varied modes of Heating and Ventilating which are continually being brought under public notice.

Garden Architecture and the proper use of Statuary, Vases, and other Garden Ornaments form an important feature of The Villa Gardener. Improvements in Garden Tools, Implements, and other appliances, are also duly noticed and criticized.

Practical and plain instructions of what has to be done during the month, in all the departments of a Villa Garden, are given; and, in addition, plain directions for what should *not be done.*

It being unquestionable that it is on the Ladies of the Household that the general direction of the labour of a Flower Garden falls, as well as the care of Plants in the Conservatory and Drawing Room, it has always been the particular study of the Conductors, by imparting their experience on the best mode of management, to make "Every Lady her own Flower Gardener;" thus insuring a general improvement in the gardening tastes of that large class for which The Villa Gardener was specially projected.

In addition to the subjects mentioned above, a portion of the Magazine is occasionally devoted to Villa Architecture, and the management of Rockeries, Ferneries, Aviaries, and Aquariums, as adjuncts of the Villa.

The Queries of Correspondents on all subjects connected with Villa Gardening receive every attention, and are replied to at such length as the general interest of the questions demands.

The Villa Gardener is copiously Illustrated with Engravings, and is printed with a new, beautiful, and readable type. The size is super-royal octavo, the Price Sixpence, or Six Shillings per Annum, and it is stitched in an Ornamental Cover.

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Simple Appliances in Diseases of Live Stock.

IN this and succeeding article we purpose to take up the consideration of the various simple appliances, surgical, domestic, &c., which are so frequently required among live stock. The relative value of these are not uncommonly under-rated, a result, we fear, that has arisen from a want of greater acquaintance with the mode of action, objects of use, and effects to be desired; hence we find either too precipitate withdrawal or an abandonment of them, on one hand, while, from the same primary causes, on the other, a decided abuse follows. We proceed to notice in the first place

POULTICES.

These are valuable means of promoting the formation of pus—matter—either to be discharged directly from the surface of a wound, or from within a cavity located in the soft parts (of muscles, &c.), generally known as abscess. In many parts of the country much prejudice exists in favour of certain substances, or ingredients, besides which nothing else is supposed to possess any qualification whatever for use as a poultice; for instance, one pins his faith to linseed meal, another to bran, a third to boiled turnips, and besides many other things, the excrements of animals and human beings are actually made use of.

The essential value of an ingredient for use as a poultice consists in its property of *maintaining heat* and *moisture*. That which will hold these the longest is therefore to be chosen, but we exclude from our category, *nolens volens*, all kinds of excrement, as being not only inferior in the foregoing properties, but for stronger reasons—their filthy odour, and tendency to produce long-standing ulcers or sores, as well as positive blood-poisoning, ending in death.

Poultices are always applied in a heated condition. Great care is required in this particular, or serious consequences may take place. The proper temperature is from 112 deg. to 118 deg. Fahrenheit, and, in the absence of a thermometer, an ordinary test is the human hand, which, on being plunged into the substance, will comfortably bear the above degree of heat. The rough, hard hand of a labourer should not be chosen, as we have repeatedly witnessed. such will bear a surprising amount of heat; one who is not in the habit of doing rough work will best estimate the proper degree of temperature required, and much inconvenience as well as unnecessary pain be avoided.

In consequence of the required maintenance of temperature, those articles which exhibit a tendency to agglutinate, or stick close together, are useful in that particular, but they are objectionable, as in process of drying they form hard substances, and stick so closely to the wound and surrounding parts, that much harm is done thereby, especially in removal. Flour and linseed meal are of this class. To obviate this tendency, the substances may be mixed in various proportions; but what answers much better is to add to the heated mass a lump of hog's lard, which, after melting, should be thoroughly incorporated with it. Bran is generally used, as it is cheap, but, in point of efficacy, a mixture of bran and linseed meal is better.

Poultices should be applied *closely* to the affected parts, and, in order to secure this, an additional covering is required. The great object in all cases is to protect the spot from the colder surrounding temperature, and hasten the formation of pus; but if the poultice does not fit closely, the result is admission of cold air, rapid evaporation from the moist surface, and a stoppage of the process we desire to promote. This result is a common cause of imperfect cures in such cases as grease, &c., in the hind legs, and strangles, or formation of abscess in the space between the under jaws, among horses, foals, &c., in cattle. In each the weight of the mass is sufficient in the discomfort and fidgety state of the sufferer, to cause it to slip away from the parts and produce awkward states. The weight, therefore, of a poultice is a thing to be taken into account, for the lighter it can be made, the closer it may be made to fit. When the legs are the parts to be treated, the most useful plan is to use either a large strong, footless, worsted stocking, or make a strong canvas casing of due length, and somewhat greater cylindrical capacity than the leg itself. This is first put over the foot as carefully as possible, and when drawn into position, the bottom is secured, either round the hoof or pastern joint, as circumstances require, by means of a leather strap and buckle. (If the pastern be selected, the strap must not be drawn so tight as to interfere with the circulation.) The ingredients of the poultice, being already mixed in a pail or other suitable vessel, are now to be packed within the canvas case, so much being used as may either cover the leg all round, or largely over the particular part, and the top of the case being drawn towards the leg, a strap secures that also, and over the whole a long bandage is carefully bound.

This process cannot be carried out with other parts so well as the legs; the jaws, for instance, being a very awkward place to which we may secure anything of the kind properly. In fact, we have seen much harm result from their use, and of necessity were compelled to discontinue them. In some of the forms of strangles, great weakness accompanies the disease, and the weight of a poultice is a serious inconvenience. It is as much as the creature can do to hold his head without a poultice, and the addition of weight proves a great burden. In such cases many practitioners make use of a hood for the head, which, being placed in position, is packed beneath the jaws with several thicknesses of soft flannel, a bag filled with cotton wadding, or a thick sheet of spongio-piline, all of which are previously heated and applied dry. By these means the weight and other objections of an ordinary poultice are generally avoided, and good results are obtained. With the use of spongio-piline, capital results take place, if it be applied after immersion in hot water. Two pieces of proper size should be employed, having greater superficial extent than the parts to be treated; one is first applied and kept in place the allotted time, and the second is to be applied direct from the hot water the moment the first is removed. In this way alternate pieces are applied, and they prove soothing and curative, while they may be caused to lie close to the skin, and are of no appreciable weight, the waterproof and non-porous outer surface admirably preventing any evaporation and sudden cooling, which so often mars the efficacy of a poultice and thus delays cure.

In the renewal of poultices, also, there is much that should be avoided. They should never be allowed to remain on too long, and thus become displaced, hard, dry, or cold. As the great properties, heat and moisture, are gradually being dissipated, a renewal poultice should be prepared, nothing being left but the pouring on of the hot water and subsequent mixing to be done. Boiling water should, as a rule, be used, the whole being stirred with a stick, &c., and the mixture frequently tested, as before explained, until the heat is sufficiently reduced. At this stage the old poultice is to be removed carefully and quickly, and the second put in its place, avoiding exposure of the diseased surfaces as much as possible, for, being moist and heated by the poultice, the skin is now doubly sensitive to the effects of outward conditions, from which dangerous reaction may speedily follow.

It may sometimes happen that such materials as bran or linseed meal may not always be at hand when a poultice is required immediately, or considerable delay may be occasioned by seeking them. Such an event is by no means uncommon in the experience of some veterinarians. Called in a hurry to some lonesome and small farm, the owner has not thought of them, and if they are to be sent for, hours may be wasted. Besides, a great quantity of the particular substance may be wanted, and in the end prove very expensive; again, it may not be essential that such costly articles as linseed meal, or even bran should be used, and therefore we must endeavour to adopt always such things as may be not only available, but also effective, and costing the least, for in each case of death these, trifling though they appear at first, help to make the loss still greater.

When the feet are diseased, poultices are not uncommonly used for a long time, and being large, much of the usual substance is required, it may be amounting to several bushels; and we have found common sawdust, no matter of what kind, as good as anything. The feet are first placed in a suitable bag, and the sawdust previously saturated with hot water, is packed beneath and all round, a strap securing the whole round the pastern joint.

It is sometimes required to continue for a long period the application of cold by means of a mass in the same way as heat is conveyed by a poultice. Some practitioners prefer this plan to all others for the feet of horses under fever—founder or laminitis; nothing, therefore, can be better or cheaper than sawdust, and it is free from several objections which apply to bran, linseed meal, boiled roots, &c. It does not dry hard, it does not become soon sour, and its cheapness admits of its being used largely. Sawdust is objected to as a poultice for wounds, because it would greatly irritate them; but this may be overcome by first covering the wound by one or two layers of thin calico, &c., or applying the poultice in a bag on the outside. Pine sawdust often proves very useful in this way for *drawing* wounds, on account of the resin it contains, thus acting as a medicated poultice, of which more hereafter. In cases of emergency we have used the chaff, or flyers of wheat, and sometimes hay and straw cut by the chaff machine, each of which may be caused to accomplish all that is desired, viz., the application of *heat* or *cold*, and *moisture*, by the exercise only of care and diligence.

We have now to refer to another class of remedies which are frequently required, viz.,

MEDICATED POULTICES

or poultices having some medicinal substance incorporated with them, for the purpose of producing some special effect, in addition to those effected by poultices of the common kind. For instance, when the feet have been injured, and dirt or other foreign substances have been allowed to enter; or when wounds are red, foul, and angry, or cold and producing no proper discharge, it may be necessary to promote the formation of pus somewhat more rapidly, and thus liberate the parts both from the irritation of foreign substances and the surrounding congestion, &c. In such cases a medicated poultice is called for, and it merely consists of one of the ordinary kind, having mixed with it some spirits of turpentine, common turpentine, or powdered resin, the hot water being sufficient to melt the latter when poured upon the whole in a boiling condition. When resin is used, some lard should also be added, in order to avoid the tendency to stick and become hard. The quantity of turpentine or resin must not be too large, or awkward results follow, a tablespoonful of the spirits, or a piece of common or Venice turpentine of the size of a walnut, being ample for a large poultice filling half a small pail.

When it is intended to apply a poultice to a part in which violent pain is present, laudanum and belladonna, with various other substances are used, but we cannot give precise particulars about these, as they must only be compounded by, and under the supervision of a medical man. It will be much safer for those not acquainted with medicine to employ poppy heads, bruised and mixed with bran, &c., as most suitable. There is a danger of some medicines being absorbed, and doing great harm, belladonna being one in reference to which we cannot be too careful.

Besides employing poultices in order to *draw* the parts, it may be also required to *cleanse* them from foul, bad smelling, irritating, and even contagious discharges. The feet of cattle affected with foul, the legs of horses affected with grease, &c., are often very offensive, and need much patience in order to overcome the noisome odour arising from them. It is usual to apply some substance which will destroy this odour, and, at the same time, set up healthy action. One of the most common forms of such cleansing poultice is composed of powdered charcoal, kept warm and moist by warm water; but as the action of these appliances really depends most upon some ingredient, which is put into it as a vehicle, as bran, linseed meal, sawdust, &c., it is not essential that a disinfectant application consist entirely and solely of charcoal powder. We, therefore, simply mix with the article preferred, such agents as carbolic, or cresylic acid, bleaching powder, or chloride of lime, solution of chloride of zinc, chloralum, &c., the main thing to be remembered being, that such poultices should be frequently renewed, and always destroyed as soon as they are done with. In some instances ordinary lime is used with some other substance, as bran, sawdust, &c., but a more useful agent, which we would recommend in preference, is M'Dougall's disinfecting powder, mixed in the proportion of 1 lb. to 4 lb. of the usual article.

In the use of various leaves and plants as poultices there is nothing to recommend them further than being useful as vehicles of heat and moisture, and in this particular are not equal to the articles already enumerated.

FOMENTATIONS.

It is not an unfrequent occurrence to hear horsemen and others speak of having fomented a certain part or limb with cold water, and another will use the same expression in reference to hot water. Such is decidedly wrong, although it may be, and we believe is, generally accepted and understood. To foment a part is to produce excitement in it—to increase or quicken the circulation of blood, and thus relieve those parts suffering from congestion or inflammation, or, after such a stage as inflammation, to promote the formation of pus, and ensure relief by its discharge by abscess.

The most simple remedy is *heat*, and we have already seen that one method of applying it is by means of certain substances forming what is known as simple, medicated, or disinfectant poultices. Another kind of remedy very much in effective use is hot water, and we term its application "a fomentation." We do not need to qualify the term by the degrees hot or cold; a fomentation is always hot, for hot water excites and produces the action we want, but cold water depresses, producing an effect the very reverse of heat, and is, therefore, *not* a fomentation. Whenever we write of fomentations, our readers will, we trust, understand that we refer to hot water only, unless otherwise specified, and when cold water is used, a totally distinctive term will be made use of, by which mistake cannot possibly arise.

Fomentations, like poultices, are both simple and medicated. We notice first,

Simple Fomentations.—Hot water, varying from 110 deg. to 118 deg. Fah., is the simplest and most accessible fluid for a simple fomentation, and as the temperature is of the greatest importance, a thermometer should, if possible, be employed to ensure the precaution of not going beyond the degree named. Where numbers of animals are kept and hot water is much called for, a thermometer is a useful instrument for various purposes, and as the cost is now so trivial, it is easy to obtain one equally suitable for testing either the temperature of air or fluids, so that no one need make the matter a subject of much difficulty.

The water should not be too hot, because it may produce serious injury, and it should not be too cold, as all the time and trouble may be thrown away, with no good results; but when proper attention is observed, we may assert without fear of contradiction, that no class of simple remedies will bear comparison with fomentations for their rapid and powerful effects; and conversely, when hastily, improperly, and defectively applied, none prove so very injurious. In order to understand these propositions, we must make use of a little repetition.

Hot and cold applications are equally opposed to each other. The first opens, relaxes, enlarges, and softens the parts to which they are applied, but cold water contracts, constricts, makes smaller and harder; therefore, when we use hot applications, we must be careful that the proper heat is maintained, not only during the use of the remedy, but also afterwards, for the parts are then very sensitive, and, being moist, any cooling by exposure to air brings on the very state we wish to avoid, viz., a *backening*, so called, of the inflammation. To excite first and immediately depress is very injurious, and delays the cure and progress towards health very much indeed.

Foot fomentations, to be of use, must be applied long and continuously. We often hear grooms and others say, "I fomented for twenty minutes," and we seldom omit to add, "then you have probably done more harm than good." It is impossible in so short a space of time to impart to the substance of a limb, or mass of muscle, sufficient heat to prove of any ultimate service; the parts being but just wetted, are often left quite unprotected, by which serious harm follows. Fomentations should be persisted in for hours, and every arrangement and precaution made and taken before the application is begun. The efficacy of hot water may be usefully illustrated by the following case. Some time ago a valuable horse had become fast in the collar chain which secured him to the manger, and he, struggling, fell in an awkward position. Shortly afterwards, by his efforts to free himself, he hooked one of the hind shoes into the throat strap of the head collar, and he was thus tighter than ever. This took place in the night, and the noise he made failed for several hours to call any one to the spot, but when he was found, he was growing very weak, and partly from strangulation and heavy bruises, his head and neck were as large as two. Besides, the breathing was much impeded, and it was at first a question whether the windpipe should be opened, and from the same cause, it was absolutely impossible to expect him to swallow medicine. Our only course was to rely upon incessant fomentations, which were kept up for upwards of five hours, at the end of which time the swelling had considerably abated, medicine had been swallowed, and the patient took a small feed of oats. The plan of procedure was this:—A large copper being at hand it was filled and the fire lighted, in the meantime hot water was supplied from a distance. The horse was turned round in the stall and the head covered with two thicknesses of woollen cloth, and held over a large pail standing on a tub. Hot water was being constantly brought by one person who poured it in to make up the required heat as shewn by a thermometer, and another was occupied in pouring the water from a large jug over the top of the head on the woollen cloth. By this means continuous heat was applied and no evaporation took place, which resulted, as we have already said, in the greatest good, after which a dry hood was put over the head and neck, the parts being previously rubbed briskly with soft dry towels.

For the legs we find a proper tub, known as a leg tub, of exceedingly great value. In this the limb may be immersed for hours with ease, and to make it more effective, the hot water should be passed to the bottom by means of a large funnel and pipe, or the cold will settle at the bottom. The ordinary plan is to simply stir it frequently as hot water is added. In the absence of a leg tub, woollen bandages may be bound over the limb, and hot water poured on the top will maintain a proper heat. Pieces of old horse rug, woollen cloth, several towels, &c., may also be used in emergencies, and a most effective action may be further induced by covering these with a piece of oiled silk or gutta-percha sheeting. Spongio-piline is the article which at once fulfils all these offices. The soft side being placed towards the affected part, the outer as waterproof prevents any passing away of heat.

It should always be understood that when fomentations have been applied, the parts require to be dried as soon as possible by suitable friction and soft dry cloths, and a thick warm covering applied at once; for the legs bandages answer quite well, and for the body two or three ordinary rugs. To foment a part and leave it to dry afterwards is a bad proceeding, and does great harm in the majority of cases.

Medicated Fomentations.—The value of these have been greatly over-done as well as over-rated. It is also very likely that they came into use in consequence of a desire to expedite the action of hot water, more especially as the practice of applying it was confined to short periods, when, as we have already shewn, the minimum effect only would be obtained if any good at all came of it. Fertile imagination in this, as in all instances where it has free course and exercise, was instant in suggestions, and the result has been a whole and almost endless catalogue of remedies, which are rewarded with excellent characters for doing this, that, and the other; but whether owing to our dulness of comprehension, ignorance, something else, or the whole combined, we have to confess that up to the present time we do not appear to have recognized so many valuable properties. Our faith has not been shaken in the *invaluable* effects of hot water, *properly* and *continuously* applied, therefore we have prefered to adopt it, always feeling certain of success and ultimately obtaining it, which is not inevitable by the use of so many compound remedies.

It may be contended that the addition of certain medicinal agents are called for in some instances for the reduction of severe pain, as well as swelling; yet we do not see that to be necessary, inasmuch as pain is the result of swelling; for, as we reduce the last, the first subsides as a most inevitable result, and for this nothing can be more effective than simply hot water, under proper regulations—so far, of course, as regards outward applications only. When, however, we desire to gain time, to act powerfully on the system, and thus remove some serious obstruction, we take advantage of *internal* remedies as well. Thus, when a limb is extensively swollen, or, as in the case cited in the preceding article, we may desire to give some drug which we know will assist by influencing one or more of the internal organs, as the bowels or kidneys; but when the power of swallowing is denied, no alternative is left but to rely entirely upon fomentation; and in selecting from our Note Book of cases, we could not give a more complete instance of the great value of a simple remedy, the secret of which lay only in the continuous heat and application. The use of simply hot water may be carried on for hours, and without enormous trouble or expense; but if we are inclined to decoctions of herbs, and hot applications of the juices of rare plants and those only of local growth, which fanciful minds and quackery suggest, we may fritter away not only valuable time, but also money, and, it may be also, the life of a valuable animal.

We have now to notice

COLD APPLICATIONS.

The applicalion of cold to a diseased part is intended to effect totally opposite results—those of depressing the circulation, limiting the flow of blood in the part, and it may be also to brace up or strengthen the tissues. While hot water is most suitable for the soft parts, cold is commonly taken advantage of for the legs, &c., and those parts where sinews or ligaments are present, to the exclusion almost of muscle. Some practitioners prefer cold water to the feet under inflammation, likewise to the legs when tendons are sprained and lacerated, while others always use hot, and, we think, with greater shew of reason.

There is an opinion largely abroad that cold water bandages are necessary to hunters and carriage horses, &c., in order to keep down inflammation, and prevent the consequences of work, such as thickening, puffiness, knuckling over, &c. Some prefer linen, others woollen material, and these soaked in cold water are put on and allowed, generally, to become dry, the rule, as it is expressed, stating that these should be frequently wetted; yet notwithstanding this departure from the plain directions, puffy legs diminish, and tender spots become less sore; and how is this? Simply because the benefit has not arisen from the cold, but from the *reaction.* As soon as the cold is applied, the first effect is to constringe the vessels, but the second is to promote warmth and increase the circulation—which is the very essential old and battered legs require. They have lost their tone by hard work, the circulation is enfeebled, and the stimulus of cold—succeeded by reflex action on the blood-vessels—is the indirect means of restoring the balance of function which has been lost. Such is the true principle of hydropathy, and in this form it has existed, been known and practised by every stableman down from his majesty the stud-groom, or coachman, to the least among the strappers. From sweating the legs of horses in the stable, the principle has been taken to higher quarters; and, as applied to the human subject, it is now dignified with the name of a science.

When the application of cold is really required, no good can come of using it by fits and starts. To be of essential service, we must avoid the reaction which we have already alluded to. It is a common plan to immerse a limb in cold water, frequently renewed for some time before an operation is to be performed with the knife, the object being to produce a depression of temperature throughout the very substance of bone and tendon, &c., and thus materially limit the flow of blood. In such a case, the cold must be persistently kept up, or we fail in our purpose. The plan simply consists of causing the animal to stand with the limb in a leg-tub, an assistant being required to add from time to time a pail of fresh-drawn cold water.

In order to intensify the action of cold water, particularly in warm weather, various saline substances are called into requisition—the most common being nitre, saltpetre, so-called sal-ammoniac, &c. These produce a low state of temperature by their solution in water; therefore, they should only be used at the moment they are mixed. For, after they are dissolved, the temperature of the fluid rapidly rises to that of the surrounding atmosphere, and no other good than that of simple cold water can be obtained

CLYSTERS OR ENEMAS.

Clysters, injections, lavements, or enemas, as they are variously termed, form exceedingly valuable agents in the treatment of disease among the lower animals. There are several kinds, which we proceed to notice in the usual order of application.

Fluid Enemas.—The most common form consists of simply tepid water, or of water in which common salt has been dissolved, or hard or soft soap rubbed down to form a tolerably strong solution. The common object of injections is to promote the action of the bowels during inactivity or costiveness; and, likewise, in cases of overloaded stomach. For this purpose, the water should not be too hot, as the object may be greatly frustrated; but in order to effect a more speedy solution of salt or soap, it may be used at a boiling heat by being poured upon either when placed at the bottom of a pail; and after agitation, or standing some minutes, the required temperature—not more than 100 deg. Fahr.—may be obtained by adding cold water.

It scarcely needs to be explained that injections are passed into the rectum or bowels by the anus or fundament—an assistant usually holding aside the tail with one hand while he steadies the instrument with the other; a second person being employed in supplying the water from time to time.

Various instruments have been recommended, most of which still continue in use in different districts. The oldest consists of a large bladder armed with a hollow wooden nozzle or pipe, the outside diameter of which is not more than 1 inch, and the whole length about 6 or 7 inches. A piece of elder wood, after the pithy part has been removed, and the free end properly rounded off, forms the usual primitive country appliance. The opposite end is grooved or notched by a knife; so that, in tying on the bladder, greater security is maintained and accidents avoided. To fill the apparatus, the bladder is immersed in the fluid, pipe upwards, and a small funnel inserted through which the water is poured. When sufficiently charged, the whole is carefully lifted out, and the wooden pipe being gently inserted in the rectum and held there by one assistant, another, holding the bladder in both hands, exerts steady pressure all round, by which process the contents are speedily discharged into the bowels.

Another instrument consists of an ordinary brass, tin, or Britannia metal syringe, capable of holding from 1 to 3 or 4 pints. The objections to this are, it is inconvenient for being carried about, but this does not apply in those cases where the instrument is for home use. There is also a liability to produce irritation of the rectum by frequent use during protracted disease, owing to the necessity of removal after every discharge. And unless great care is exercised, the barrel is subject to bruises, which derange the packing of the plunger, and soon render the instrument worthless. Reid's (expired) patent syringe is a very useful but costly instrument. A long tube of caoutchouc, or covered wire, &c., mounted with a suitable wooden nozzle, communicates with a brass barrel and plunger. The nozzle is inserted in the rectum and held there, while a person works the syringe, as it stands some distance away, in the pail containing the water. The effect is to produce a continuous stream of water without removing the apparatus from its position, while the operator may escape the annoyance so common with other instruments, which is the forcible discharge of the contents of the bowels, not of water merely, but, it may be, of bad-smelling fæcal matter also. This instrument is now fitted for compound uses, as a probang or choke rope, for washing out the bladder and gaseous enemas, but it is more adapted for the service of the veterinary practitioner than for the stable where only a few horses or cattle are kept.

The most simple and yet efficacious instrument is the enema funnel, which may be obtained at a small cost, and, unlike the syringe, is not rendered useless by blows or falls, &c. The funnel may be almost any size from the capacity of ½ pint to 1 quart, but we do not see any reason why it may hold any more than the first-named quantity. At the bottom of the funnel the pipe is turned at right angles, and continued to the extent of about 12 inches, tapered, and rounded at the extremity by the laying on of a quantity of solder. To use the funnel, the pipe is inserted gently within the rectum, funnel upwards, and as the water is poured in at the top, it descends with a gurgling noise into the bowels without any difficulty.

The quantity of fluid usually employed for horses and cattle is about 2 or 3 quarts at a time, and as we have already said, should be about 100 deg. Fahr. The frequency with which injections should be used, will depend very much upon the disorder. If the object be simply to excite the bowels, and assist a moderate purgative, two or three may be given in the course of the day; but when the stomach is overloaded, or obstinate constipation exists, it may be needful to repeat them every half hour until the pulse, respiration, and temperature decide that the danger is nearly over.

Gaseous Enemas.—There are cases where more decided effects than fluid injections can give are required, such as violent spasm, the result of overloaded bowels, &c. Notwithstanding the fluid injections have brought away much fæcal matter, extreme pain continues, and the suffering creature rolls about greatly to his own danger, and that of the attendants. Such spasm may be more or less subdued by a gaseous enema, and the procedure is as follows:—

Reid's patent syringe has fitted to it a separate barrel, which screws on to the main barrel at right angles. This is filled with tobacco and a hot cinder, and the tube is screwed on at the opposite end. The piston is then worked freely up and down, which has the effect of driving air through the heated tobacco, along the flexible tube, and as soon as a full stream of smoke is evolved, the nozzle may be inserted in the rectum, the action being kept up for ten minutes or more, and renewed at frequent intervals as may be required. The effect of a tobacco smoke injection is that of a soothing or sedative kind, the muscular fibres of the bowels, which, during spasm, are firmly contracted, being induced to relax, and thus pain is reduced or altogether removed. Horses have been known to derive almost immediate benefits from such means, for when caused to rise from the ground when rolling in a fit of spasm, they will stand quite still, and suffer the smoke to be injected during almost any length of time.

In some extreme cases, small portions of dried opium are placed among the fibres of the tobacco, which, during the burning, give off powerful fumes of an anti-spasmodic tendency. As a rule, however, and in all ordinary cases, it is best for amateurs to rest solely on the use of tobacco alone.

SETONS.

Like a good many other remedies for the cure of disease which have fallen into disuse or disrepute, setons are now not so much in request as formerly. At one time, and even within recent years, it was quite as common for a seton to be inserted for the cure of minor complaints, as in earlier times bleeding was the universal and all-important means of dissipating all the evils flesh is heir to, as well as of those which existed only in the fleshly imagination of hypochondriacs, and old maids who were affected with doctors on the brain. If a dog were brought suffering from sore throat, the treatment was, "Insert a seton beneath the jaws, extending to the chest." A horse was served in the same manner; and if the cow proved guilty of such a sinful malady, which was rarely observed, she had one a little longer and ever so much thicker, because she is such an insensible being—so it was said. When horses suffered from an attack of indigestion, which caused a hind leg to swell, the most orthodox remedy was a seton; if the feet suffered from inflammation, a seton was put through each frog. In chest affections, such as inflammation of the lungs, one of extra length was recommended; "Indeed," said one authority, "it can scarcely be too long."

We well remember, when this axiom was uttered, the author did not reckon upon his auditory, for among the number was an aspiring groom, who, having been some years in the service of an officer in the army, had therefore seen large experience, and was already, as he thought, in the shoes of Esculapius himself. This worthy had witnessed the extended adoption of setons for many ailments, and having a roving commission among small horse and cow proprietors of the adjoining town, practised among their animals for his own immediate benefit, at once began to torture them for everything. It was marvellous how many yards of tape that fellow got through in a few weeks. He did his work well, too. The last case he was permitted to try his hand upon died before it could be decided whether his seton had any beneficial effect, with which also died out, and justly, his reputation. The creature was suffering from contagious lung complaint, notwithstanding which she was cast upon the ground and, by means of the usual instrument, a seton was inserted, commencing at the jaws and passing down the front of the neck, over the chest, between the fore legs, terminated somewhere near the navel on the abdomen, certainly not less than 5 feet in length.

However absurd this illustration may represent the remedy, it is nevertheless a certainty that setons are very useful agents in the cure of disease; like everything else, they should be adopted with mature judgment. They are constructed as follows:—A suitable needle having an eye sufficiently broad to receive tape or round cotton cord, is passed beneath the skin for some distance, either over or contiguous to the parts diseased, an opening being usually made through the skin at the respective points of inlet and outlet. Sometimes a needle having a sharp broad point is made use of, which makes both these orifices; but usually they are first made by either a lancet, forceps, or an appropriate knife. Slight alteration is made in accordance with the nature of the parts. If the skin is loose and mobile over them, it may be taken up in a thick fold by the left hand, and the sharp needle passed through one thickness of the skin. Afterwards the skin is allowed to recede to its proper position, and the needle is gently pushed with a sidling motion along the surface of the muscles, &c., the left hand by pressure on the skin directing it along, as force is applied by the right. When it has been passed sufficiently far, the skin is again gathered into a fold and held tightly by the left hand, while by extra force the needle is caused to come outwards. The skin is then smoothed over, needle drawn through, and the tape secured.

In those parts where the skin is thick and tense, tightly bound down and unyielding, a somewhat different plan is adopted. The needle is furnished with a *blunt* point, and at the extremity is a small rounded knob, or eminence. An orifice is first made through the skin, usually by means of forceps not unlike scissors, the points of which are hooked. These, being caused to grasp the skin, are pressed together, they enter and divide it, leaving a gash about 1 inch long. A second is cut at the point of exit. Then the blunt needle is passed under the skin from one hole to the other, drawn out, and the tape secured.

There are two ways of securing the tape. One consists of bringing both ends together, and tying them in a common knot; the other is more preferable and less liable to accident, as there is no loop to catch, whereby it may be drawn out or tear the skin. It merely consists of tying a separate piece of wood to each end, and letting them hang free.

The next condition to be noticed is to take care that the seton is moved, or drawn backwards or forwards every day, the object being to prevent adhesion, or obstruction to the flow of pus, and to promote the discharge. The parts below the orifices should likewise be kept clean, and free from accumulating discharges, as much irritation and even blemishes may result; but if the hair beneath, over which the discharge may flow be moistened with a little olive or rape oil, blemishes will be prevented.

The object of a seton is to produce *continued* irritation, and by the constant formation of pus, drain away morbid matters from the system; in ordinary estimation they are solely for the purpose of overcoming some already existing local inflammation; thus they are applied over the seat of spavin; beneath the jaws for chronic irritation of the throat and threatened roaring, &c.—and one of the most useful ends to which they are applied is for the prevention of black-leg in young cattle. For this purpose, one of 10 or 12 inches is inserted in the lower third of the neck and dewlap, and this, while it certainly reduces the over plethora of the system, at the same time produces a temporary inconvenience and limits the thriving properties of the animal.

It is a common plan to dress the tape or material used, a little resin or green ointment being usually selected, but practitioners will also use blistering ointment, and sometimes the tape is previously saturated with a preparation such as tincture of cantharides, &c. The objections to setons are, their slowness in action, therefore they are not suited to cases of high and active inflammation; and besides this they cause ugly blemishes. In the first instance, they must always give way to more powerful and immediate agents, and in all cases where they may do good, it may be wise not to observe the scar with too critical eye, for a good animal restored with a blemish may be worth a hundred, whose organs may be incomplete or unsound by reason of false treatment, and too great fear of contracting such marks.

ROWELS.

When farriers of the olden times desired to produce continued local irritation, and so divert the action of circulation from parts already in a state of unusual vascular excitement, they made use of rowels. In most respects these surgical means are similar to setons, but are neither so convenient nor so sightly.

In the formation or insertion of a rowel, no needle is required as for the seton, but a pair of scissors, known in surgical language as forceps, having sharp and hooked blades, are employed to divide the skin as it is held in a fold between the fingers. A slit of an inch or more is made, then the hook of the forceps, which forms the handle, is inserted, and by a tearing action the skin is forced from its connexions with the muscles, &c., beneath all round the opening, for the space of 1 or 2 inches. Many persons accomplish this by the fingers only, but sometimes strong fibres are met with, which will resist much pressure, and even inflict wounds upon the operator. It is therefore safer to divide these by the knife, for a cut produced in forming such a surgical wound may prove not only inconvenient and troublesome, but very painful, and the cause of anxiety.

Having separated the skin in the manner described, the next course is to insert some foreign object in order to prevent union, and set up so much irritation that pus or matter may be formed and discharged through the opening. The stereotyped instrument of the old farrier is a circular piece of leather, cut from the uppers of a boot. In diameter, it is recommended it should be about 2½ inches, and a circular hole of about 1 inch in diameter is placed in the centre. The next course is to arm the rowel by means of tow or soft twine, which consists of winding one of these materials round the circumference of the leather, commencing from the centre and passing outwards, and so on until the whole of the leather is completely covered. This proceeding has for its object the effect of creating more irritation than the simple leather would do, and when even yet more powerful means are required, the whole is saturated with blistering oil or ointment, turpentine liniment, savin or resin ointment, besides no end of other ingredients to which ignorance alone would resort or attach any value.

To insert the rowel some dexterity is often required, as the external opening is, or should not be, so large as the rowel itself, or it will fall out. The most simple and useful plan is to double the rowel, so as to form a half-moon shape, and pass one end through the incision in the skin, turning it beneath and onwards, until the other end has also entered, when the disc or rowel is flattened or brought to its proper shape, and left so that the central opening will correspond to the hole in the skin, and thus admit of the passage of pus as it forms.

It cannot be doubted that a rowel may be a very effective surgical remedy under certain circumstances, but we have always entertained the greatest repugnance to it in consequence of the necessary amount of forcibly tearing away of the skin, which savours of so much barbarity rather than simplicity and saving of pain. Besides, we do not conceive in any other respect that they are superior, or even equal to a seton, which may be inserted in one-twentieth part of the time, with far less pain to the animal, and in addition, possesses greater curative powers. There have been, however, many instances in the course of our experience in which the proprietor will have his way; instead of taking advice, he will give it, unhesitatingly names all the remedies he insists on having administered, and having a lingering attachment for old-fashioned remedies, boldly demands that a rowel shall be inserted. Under such circumstances we have refrained from the usual cutting up of the upper leather, and having formed a moderately-sized ring of soft tow, and smeared it with some stimulating unguent, we have substituted it for the more clumsy and necessary disc or washer-like body usually recommended. In this way we avoid much of the barbarous ripping up of the connexions of the skin with the subjacent textures, and in the end produce all the irritation that can be expected from the remedy. This method has also other advantages. The soft, yielding ring of tow is easily removed and readily renewed, while the leather washer is a bulky, awkward affair, removed only by difficulty and causing pain; and when it requires cleaning, men are not always willing to undertake it. The tow is merely drawn out by means of forceps and thrown away, another ring being ready for insertion when the first is withdrawn.

It remains only to add, that whenever rowels are used, the parts below require to be kept free of the discharge, or great irritation and blemish occurs. As already recommended, it is a good plan to smear the skin below the wound with oil or lard, which has the effect of guarding it from the action of the fluids discharged from the wound.

The purposes for which rowels are employed are much the same for which setons are advised, but, it must be observed that they can be of service only in chronic and sub-acute forms of disease, their action being too slow and passive to be of any service in acute and active stages of any malady. It was a common practice at one time to rowel for everything almost. When horses were periodically subject to a swollen hind leg as a result of indigestion and neglected stable treatment, in the place of sensible investigation as to causes, and institution of proper routine, a rowel was inserted on the inside of the thigh, and with this source of irritation, the poor creature was doomed to work days and months even. When others suffered from constant cough, dependent upon a heated and impure stable atmosphere, instead of giving fresh air, a rowel was recommended to be inserted between the jaws. Such a method of curing continued until the animal died from complicated disease. Later, the seton took the place of the rowel, and it has been caused to perpetrate as much mischief and suffering.

Not contented with the usual irritation derived from tape as a seton, or leather as a rowel, many persons have substituted the fibrous root of poisonous plants, black hellebore being one of the most common, by which they have hoped to irritate and cure powerfully and rapidly. As a cure for blackleg, and also as a means of prevention, hundreds of young cattle have thus been tormented, and not a few have died from the effects of absorption of the poisonous principles of the root. A few years ago, a large farmer in Northamptonshire lost the greater portion of his young stock by these means, and we could name many other cases of a similar character which have come under our personal observation.

To conclude, we would urge our readers to use only simple remedies. If a seton or rowel is recommended, let simple tape or tow and blistering ointment only be used, and there will be no fear of awkward consequences.

BANDAGES.

The common value of bandages, we verily believe, is not appreciated so much as they deserve, and, therefore, as simple means of good they are either entirely set aside or used at wrong times. We will notice some of their most common and valuable properties.

Bandages are used as dry applications and sometimes as wet ones. In the first instance, their offices are for maintaining poultices or various dressings in proper position, and sometimes for the purpose of producing direct pressure upon a particular part. In such cases their value depends most upon the strength or toughness and unyielding nature of the material of which they are made than upon anything else. Weak and yielding material affords no support, and under the motions of a fidgety animal proves worse than useless. For the purpose named, nothing answers better than long strips, about 3 or 4 inches wide, torn from a piece of strong "wrappering"—a material easily obtained from drapers, whose goods are usually received packed in it. From this circumstance it is also known as "pack or packing-sheet."

An ordinary bandage is about 4 yards long, but for cart horses, and when the limb is made somewhat bulky by dressings, &c., the length should not be less than 6 yards. *The edges must not be bound*, as some persons in mistaken economy have done, for the result is the production of a hard edge, which galls the limb, sometimes frightfully. One end requires to be mounted, and it is to be done as follows:—First fold down the corners flat towards each other, leaving about ½ or ¼ of an inch of the end. Stitch down these flaps, and upon them a piece of tape, doubled, the free ends, about 15 inches long, being left for tying when the bandage is put on.

No further work is required, the bandage is ready for use, and to be applied as we now direct. Fold the tapes inwards and across the end of the bandage, and commence to roll it up from that end, which process will require a little practice before it can be done neatly. We will now suppose the leg has received the intended dressings, &c., and so we begin at the lowest part, first laying flat the free end of the bandage on the bare leg, or upon not more than a single layer of covering that may be used. The roll must be outwards, so that in passing it round the leg it is being constantly rolled over the surface and unwound at the same time. By this method the first turn is made, passing over the free end and thus securing it; the next is carried somewhat higher, the next higher still, and so on, until the whole surface is covered, and it may be necessary to return, forming another layer as the operation descends. At the completion the tapes are drawn out, one being passed round one way, and the other in the opposite, and, meeting on the outside, they are tied in the ordinary manner.

When direct local pressure is desired, as, for instance, over a wound in which an artery or vein has been opened, and a large flow of blood is to be stopped, the same kind of material is the most useful, providing it is a part to which a bandage can be applied; and in order to give full effect to the process, we first pass the bandage round three or four times, layer above layer, and thus obtain a hold that will not give way by slipping. When we reach the part where pressure is particularly desired, a pad of tow, rag, cotton, wool, &c., is laid over it; and, passing the bandage several times in half-layers upwards, returning in like manner downwards, the requisite pressure may be obtained, or it may be increased by placing a piece of leather, wood, or sheet-lead over the pad itself.

Dry bandages are sometimes used to brace up the legs of aged and hard-worked animals. We do not see much use in them for that purpose, and therefore have never recommended them. They are, however, extremely valuable after the legs have been washed, particularly in cold weather, and having tested their efficacy, we advise their adoption rather than asking a groom to do what ninety-nine out of a hundred cannot do, viz., to rub the legs dry. After washing the legs, as much of the moisture should be removed as is possible by pressure and rubbing with a coarse towel, and before they are allowed to cool, thick flannel bandages should cover all the parts wetted, viz., as far as the knees and hocks, and above these no washing ought to be done.

Wet bandages have a corresponding use and value in the stable. Stale legs are sometimes very much improved by them, the swelling or gumminess disappearing, and the natural form and fineness becoming more prevalent.

There are two kinds of action to be derived from wet bandages, one a continual cooling, the other first cooling and subsequent reaction, or heating. When, therefore, it is necessary to produce a continual cooling action, the bandage should be composed of thin and coarse material, and cold water should be continually passed over it, thus producing a constant source of evaporation from the surface. But where we desire to reduce the puffiness of stale legs, we then set up a sweating process, and to do so best is to use a thick woollen bandage wrung out of cold water, which is to be retained even long after the leg has given evidence of being much warmer than before. Many grooms make use of these means, ignorantly believing they are adopting the cooling process, which is, however, precisely the reverse of this.

There is yet another kind of bandage to be noticed. It is known as the "many-tailed bandage." As there are many parts of the body which will not admit of an ordinary bandage being applied, the many-tailed one suits admirably. It is thus constructed. Two pieces of stout material of equal size are taken—perfect squares are best—and one side is cut up into slits or ribands, leaving about 2 inches of complete margin only. The same number of slits must be made in each, so as to produce the same number of bends or tails. In applying these glue must be used, the outer margin or border being glued on one side of the wound or affected part, the tails facing each other. The wound is dressed after the glue has set, and the tails so arranged as to correspond, are brought together and tied. By these means wounds in awkward parts may be closed without inserting sutures, or at least with only a few, and local pressure obtained with the most satisfactory results.

SUTURES.

Sutures are simply surgical means of uniting the lips or edges of a wound, so that as the healing process is going on, the wound closes or grows less, and the break in the skin, &c., becomes obliterated. They are not the only means by which wounds are closed, but are nevertheless most commonly made use of, and to the various kinds which the veterinarian employs we shall now direct our attention.

The most simple and common is the twisted suture—a term, however, which conveys but little meaning of its exact nature. The materials used are pins, and tow or soft twine; the former are passed through the skin, and the latter twisted round the first. The pins should be strong, of requisite length, and have sharp points, or they will neither stand the pressure or enter the skin; indeed, a round point is the very worst, and it has been found that to flatten or beat it square or triangular answers every purpose very well. The length of pins required varies from ⅝ of an inch to 3 or 4 inches. When wounds are inflicted about the eyelids, and in parts where the skin is thin and loose, small pins will do; but when the skin is thick, and not easily moved over the subjacent parts, as on the legs, haunches, &c., then large and even thick pins, such as are called carpet pins, are required.

When a wound is to be closed, the parts are first examined in order to see how the sides may be matched, and care is required that no dragging or puckering results, which may ensure a large cicatrix or swelling over the wound, besides delay in healing. When all this has been provided for, and foreign bodies removed, a pin is to be passed through the edge of the skin on one side, from without inwards, avoiding all other tissues. The skin on the opposite side is next brought up, and the pin point passing under it, is caused to come out about ¼ or ¾ of an inch from the raw edge. Thus two edges of the skin are included, but from tension and pressure, one will slip off from the point if the fingers are removed, therefore, the binder must be put on before any more of the wound is closed. This consists of soft twine, or tow that has been drawn out and twisted, and is passed several times beneath the pin from one side of the wound to the other, and across, so as to form the figure 8. When sufficient has been used, the ends are tied in a common knot; but, as a rule, and when soft twine is used, a single loop answers perfectly well. After the first, another suture is inserted, and so on at regular intervals, of say 1 inch or thereabouts, until the wound is closed; and it is well to observe that the lowest part should be left slightly open, that better escape for pus will be ensured, or an awkward abscess may result.

We have said the pins may present some difficulty in passing through the skin, and to overcome this, several plans are resorted to. One consists of using a triangular stiletto, or needle in a handle, with which a hole is first bored; another in squaring the point of the pin with a file or hammer, and so raising a number of cutting edges, which enables the operator to pass the pin with very little trouble indeed.

Besides the twisted suture, there are others in common use. The interrupted suture is nothing more than thread, silk, or twine, passed from one side of the wound to the other by means of a triangular and curved needle, the skin being drawn together, and thread or twine tied in a firm knot. A number of such stitches or sutures are inserted at short intervals as may be required, and it is necessary to observe that they require to be somewhat closer than the twisted suture.

Another form of suture is called the continuous or uninterrupted, from the fact that the thread or twine employed is passed from side to side continuously until the whole of the wound has been included. The twine is next drawn tight in order to close the lips fairly and evenly, and the ends are tied, sometimes by being brought together, or by passing beneath the first or next stitch.

The metallic suture, so called because metallic wire is used, consists of soft wire, drawn from an alloy of lead and tin, of several sizes. This is preferred by some practitioners, and used generally as the single or interrupted suture, being drawn through the skin by means of a needle, and the ends, after cutting off, are twisted round each other.

Various objections and disadvantages attach to these sutures; for instance, the thread or twine used for the interrupted and continuous sutures, acts as a great irritant, besides the tension of the skin often causes the thread to cut its way out, and thus a wound ragged and jagged, gaping far wider than before, is occasioned, and in the end an enlarged cicatrix, which looks very foul and awkward. This objection is almost overcome by the twisted and metallic sutures, and more especially when the mode of dressing is properly carried out. A great deal depends upon this, yet very grievous mistakes are made, where a very little trouble taken would obviate all.

We have yet another kind of suture to notice, the *quilled*. It is usually resorted to when the skin is inclined to stand upwards, and pressure is required to produce a more even union of the edges. The quills are nothing more than half round pieces of wood, corresponding in length to that of the wound itself. Two are required, one for each side, and the flat sides are laid upon the skin close to the edges of the wound, parallel with each other. Before, however, these are so arranged, several interrupted sutures are inserted, and notches are cut in the sticks or quills to correspond. The quills are then placed in position, and the sutures tied over them, which has the effect of bringing the quills close together, flat on the skin, so the edges are maintained in an even state, by which healing is promoted, and without the tendency to form a bulging cicatrix. This kind of suture is suitable for large wounds also, providing they are evenly cut, and the same may be said of each of the foregoing. When wounds are inflicted by tearing and bruising, such sutures are not always applicable; therefore our remarks bear reference most especially to those known as cut or incised wounds, such as are inflicted by some sharp instrument.

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Implements and Machines.

[Specially written for THE FARMERS' AND GARDENERS' ALMANACK.]

DURING the past year, implement makers have not attempted many novelties. They have contented themselves with making improvements upon those machines and implements previously introduced; strengthening them, lightening them, and reducing the frictional gearing to the minimum. The last was not a good year for implement manufacturers, and especially for those who make the largest class of articles, such as steam ploughs, reaping and mowing machines, steam engines, thrashing machines, and ordinary ploughs. The war between Russia and Turkey closed up a grand and promising field for operations both in Russia and the East. Russia especially was exhibiting an anxiety to improve the condition of her agriculture by the introduction of mechanical appliances from England. A few years ago it seemed as if this giant power of the North had resolved for ever more to beat her swords into ploughshares and her spears into pruning-hooks, and the orders English manufacturers obtained from her was suggestive of a splendid business as the years rolled on, and a bright agricultural future for Russia. But, alas! the lust of conquest has rolled back the tide of agricultural progress in that country, and along with it the well-grounded hopes of agricultural engineers extending their business in that wide and, in many parts, extremely fertile empire for many years to come. Extend their business, did you say? It will take a long time to recover that which they have lost through the cruel and futile war. Austria and Hungary were opening wide their arms to receive the implements and machines of our agricultural engineers, but agriculturists in these countries have been quite unsettled, and few or no orders are forthcoming. Bessarabia was a fine field for the steam plough and the deep-cutting horse ploughs manufactured in this country, and farmers there were opening their eyes to the fact of the advantages of these implements; but nothing can now be expected from her for many a long year. Egypt, too, was becoming a fine customer, but there was no trade at all to speak of done with her this season. The year has, taking it all in all, not been a good one for agricultural implement makers generally, as depression of trade in our own country had considerable disadvantageous effect upon sales. There is one thing that must be said about agricultural implement manufacturers, however, and it is this—that they are not grumblers after the fashion of their arming constituents. When their lines do not fall in pleasant places, as they certainly did not fall last year, they put on as cheerful a countenance as possible, and trust to better fortune being in store. We hope the year upon which we have just entered will bring better luck to both farmers and implement manufacturers.

The Paris Exhibition last year occupied much of the attention of British implement manufacturers, who exhibited largely in the Trocadero, and with marked credit to themselves. In comparison with the machines of other countries, with the exception of America, which in some sections was equally meritorious, those of Great Britain stood prominently forward, more particularly in steam engines, thrashing machines, reapers, and chaff-cutters. Although not a large amount of business was done at "the world's great fair" in the French capital, it is confidently anticipated that much will yet arise out of it as soon as the nations fairly settle down in peace.

The machines which attracted more attention than any other last season were the self-binding reapers. There were many trials, and in most Mr M'Cormick gained the principal awards, being well run up by Mr Walter A. Wood. A question has been raised whether wire or twine is best in binding; the decision of judges so far has been in favour of those sheaves which are bound with wire; but this is not saying that cord may not be found to be the best in the long run. In last year's ALMANACK we remarked, "The one thing that was specially wanted in connexion with the reaping machine was a self-binder. During the past season that missing link in mechanical reaping has almost been satisfactorily solved." Since the season of 1877, various improvements have been made on the self-binder, but the sheaves are not yet so well trussed as they ought to be. Last harvest, however, gave opportunities for noticing defects which 1877 did not afford, and we have reason to know that in the coming season the means of tieing and laying off the sheaves will be better. One decided novelty introduced last year was a mechanical horse hedge-cutter and trimmer, the invention of Messrs Hornsby & Son. It is said to do its work remarkably well and quickly, and with little expense in comparison with that incurred by hand labour. Some people still hold the notion that the introduction of such labour-saving machinery is injurious to the interests of working men. No such thing. The introduction of machinery has in all cases been accompanied with a rise in wages and an improvement in the educational tone of the labourer, who, unless utterly crazy, cannot continue a mere clod-hopper amid the puff of the engine, the whirl of the thrashing, and the click of the reaping machines.

In THE FARMERS' AND GARDENERS' ALMANACK we follow the arrangement of the two previous years, viz., of classing the various articles under their particular heads, this plan being much more easy of reference to those in search of a special implement or machine, than were we to place the manufactures without distinction under their maker's names.

TILLAGE.

HORSE PLOUGHS.

These implements have been wonderfully improved of late years by alterations in the length, shape, and depth of mould-board, set of coulters, and make of sock. For a long time "high-feathered" furrows were in favour, but they have been gradually going out of fashion, for, pretty as they looked upon the top, the bottom was scamped, and not so much earth turned over as was desirable. Most large plough manufacturers have almost attained to a state of perfection now in the making of all classes of ploughs to suit all requirements, and adapted for all kinds of soil. Very great reduction has been made in the draught, which of course makes ploughing a much less costly operation to the farmer than it was, by enabling him to do more work in a given time, and saving the wear and tear of his teams, which is matter of much importance when horse-flesh is so dear. Among novelties this year have been a combination of wood and iron beams.

MESSRS J. & F. HOWARD'S PLOUGHS.

Among the most eminent of plough manufacturers are Messrs James & Frederick Howard, of the Britannia Ironworks, Bedford. The great characteristics of this firm's productions are strength, lightness, and durability. Messrs Howards' Champion plough is in use by hundreds of thousands. In construction, these ploughs are arranged so as to combine the advantages of high cutting ploughs, which lay the furrows at acute angles, with those of the rectangular or low-cutting ploughs. The B plough is a specially useful implement. With four horses it can lay over the heaviest soil, without suffering the least from any strain. By a change of bodies the various processes of paring, digging, ridging, subsoiling, and potato raising can be performed, three bolts only having to be moved.

We give a cut (fig. 1) of Messrs Howards' Champion plough, with their new screw-depth regulators. These are a ready and simple method for altering the depth without stopping the horses. The old plan of binding screws being retained, the ploughman can use either method as he chooses.

Messrs Howards' Colonial plough is manufactured especially for the Colonies and other parts abroad, where work is of a rough kind, and the means of repair difficult of access. In general design the Colonial plough is the same as the Champion B described above, but with fewer parts, and made entirely of wrought iron and steel. The beams and handles are made to take to pieces, so as to be easy of transport, and the ploughs altogether are so arranged that they may be readily put together. (Fig. 2.)

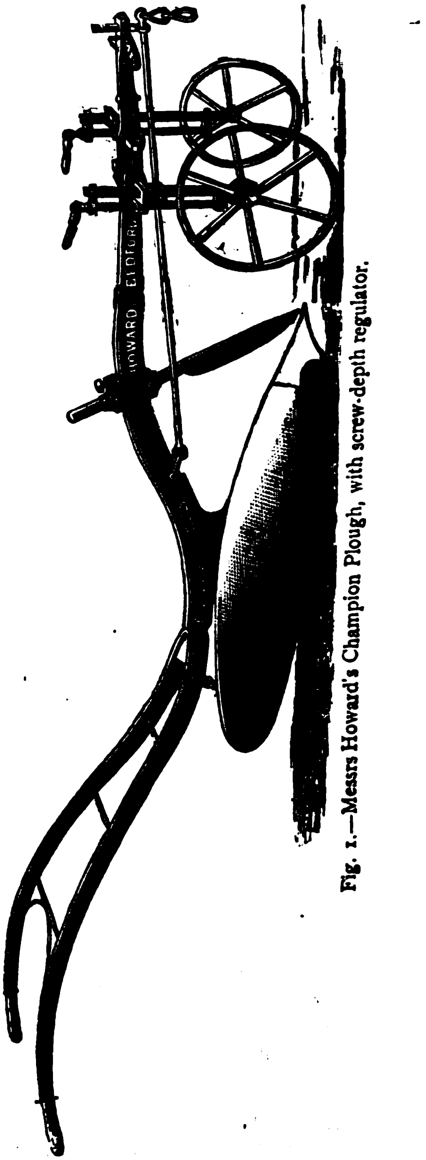


Fig. 1.—Messrs Howard's Champion Plough, with screw-depth regulator.

One of the newest things in ploughs is Messrs Howards' convertible double plough. This implement, which is light, strong, and efficient, is in a few minutes convertible into a first-rate single plough, with or without wheels; and by the arrangement adopted, there are no loose parts left scattered about to get lost. The beams are of steel, tapered from end to end, both in width and thickness, a plan securing both lightness and rigidity. The depth of plough can be regulated by a screw, as shewn in fig. 3.

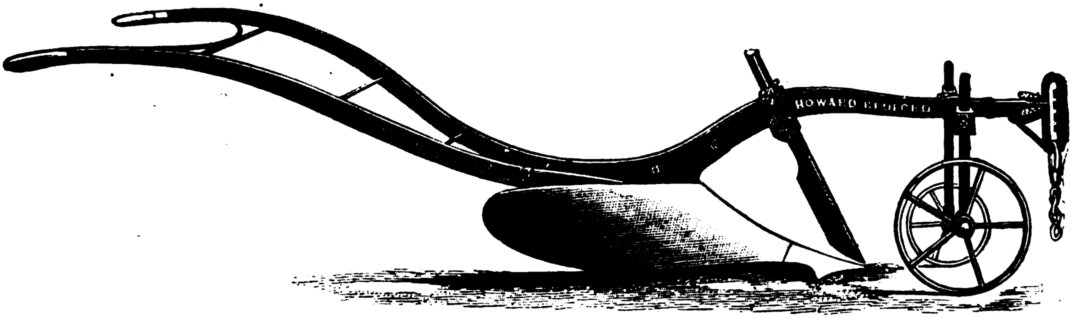


Fig. 2.—Messrs Howard's Colonial Plough.

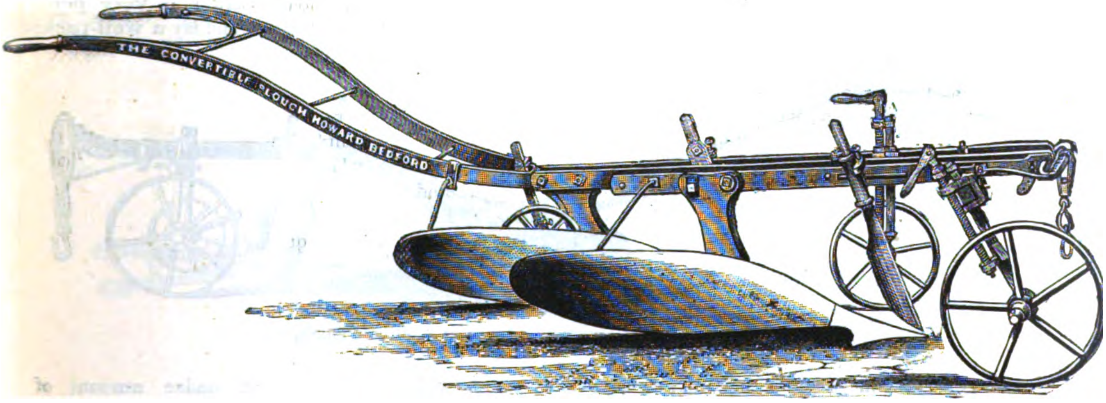

THE CONVERTIBLE PLOUGH HOWARD BEDFORD

Fig. 3.—Messrs Howard's New Convertible Plough.

Messrs Howards' Champion plough, with combined **wood and** iron beams, is a very useful, strong, and efficient implement, and is recommended for its great strength and comparative cheapness.

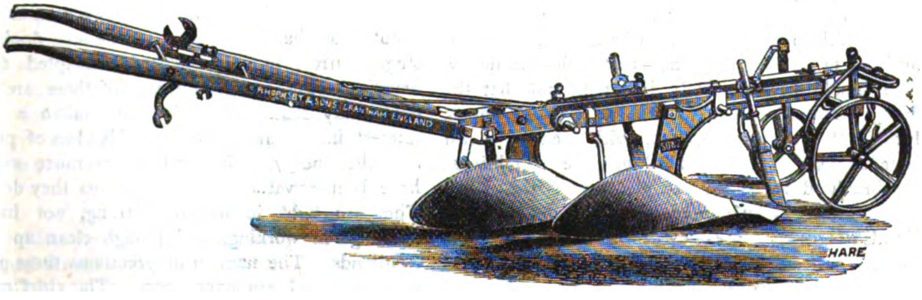


Fig. 4.—Messrs Hornsby & Sons' Combined Wood and Iron Double Plough.

MESSRS HORNSBY & SONS' PLOUGHS.

Now, what can we say about Messrs Hornsby & Sons' (Spittlegate Ironworks, Grantham) ploughs beyond this—that they are manufactured from the best material, that they are constructed upon principles which enable them to turn over the soil with the least expenditure of power? Both their double and single-furrow implements have done clever work in fields, where no skilled men were handling them—only ordinary farm ploughmen. As proof of the efficiency of these ploughs, it may be noted that they last year took 420 prizes in competitions where everyone tried to do their best. The ploughs, with combined wood and iron beams manufactured by this firm, are of excellent quality. They are light of traction, strong in every part, and well balanced throughout. In the double plough, which we illustrate (fig. 4), the adjustments for regulating the width of furrow are remarkably simple and effective, insuring both front and hind bodies being perfectly rigid and steady in work, whilst being capable of rapid and easy alteration. The plough is also fitted with a carrying wheel in the centre of the hind body, by means of which the implement may be readily turned at the headlands and removed from place to place without wear on the slides and rests. This double-furrow plough can, with the greatest ease, be converted into a single plough, the change being made in about three minutes, the same time only being required to refit it as a double plough.

MESSRS RANSOMES, SIMS, & HEAD'S PLOUGHS.

For nearly a century Messrs Ransomes, Sims, & Head, Orwell Works, Ipswich, have devoted particular attention to the manufacture of ploughs, and their efforts to produce thoroughly efficient implements, ght in draught, easy to set and manage, and capable of producing first-class work, have been attended with the most successful results in numerous competitive trial fields. One of the latest triumphs achieved by Messrs Ransomes, Sims, & Head was the award of the 10-guinea cup at the Stonehill ploughing match in Kent in October 1878. The conditions of the coveted cup were that the makers of the ploughs should conform to what is called the Kent method of ploughing—that is, that the furrow slice should be completely inverted, and that the draught should be light. Messrs Ransomes, Sims, & Head's "Newcastle" plough, with Kentish breast attached, succeeded in fulfilling the conditions. To briefly describe all the ploughs of the Newcastle series manufactured by this firm—not the Kentish-breasted one alone—they are strong, simple, and easy of draught; the beam is rigid, and, the handles being braced diagonally, insure strength over the plough; breasts of any kind, suitable for various kinds of soil or difficult nature of work; the shares and wearing parts are made of the best quality of metal, and they can easily be replaced should breakage occur, as they are all numbered; the wheels have a long axle, and are covered in for the avoidance of dirt, and they are easily adjustable. An illustration is given of the Kentish prize-winning plough (fig. 5).

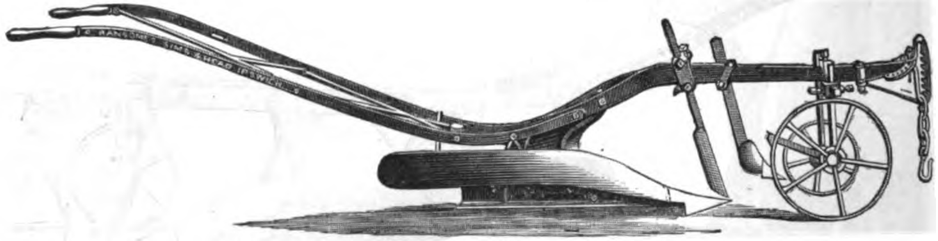


Fig. 5.—Messrs Ransomes' "Newcastle" Prize Plough.

Messrs Ransomes, Sims, & Head's double-furrow ploughs are simple in construction, light in draught, strong in make, and easy to turn at the headlands. Their treble-furrow plough possesses all the characteristics of the double, being fitted with Messrs. Ransomes' patent double wheel centre lifting apparatus.

MESSRS VIPAN & HEADLY'S PLOUGHS.

Messrs Vipan & Headly (late Hunt & Pickering), Church Gate and Gallow Tree Gate, Leicester, have been famous for their manufacture of ploughs; these being light and durable, on account of the excellence of the raw material out of which they are made, and the quality of the workmanship employed upon them. At the Hull meeting of the Royal Agricultural Society of England, they gained the first prize with a good many points to spare, the judges at the Royal declaring that "the mould-board is of very perfect orm, calculated to work clean, and lay a well-packed urrow without absorbing an undue amount of power." What higher tribute could be given to their merits?

MESSRS DAVEY, SLEEP, & CO.'S ONE-WAY PLOUGHS.

Messrs Davey, Sleep, & Co., St Germans, Cornwall, have gained a reputation second to none in this country for the manufacture of one-way double and single furrow ploughs, specially adapted for the colonies, where a good many of them are being continually sent. The firm has taken a special interest in the manufacture of this class of ploughs, and the energy, skill, and perseverance exhibited have been rewarded with the success they deserved. They are light in draught, strong, not liable to breakage in working, and plough clean up to the headlands. The number of premiums these ploughs have obtained are over 2300. The chief of these prizes were awarded after careful testing by the dynamometer in lea and stubble ploughing, and in ploughing down farmyard dung. Ploughs of such a structure are invaluable on the farm. These ploughs are admirably adapted for hill-side cultivation, can be moved either right or left, and can be managed easily by any ordinary ploughman; by the use of these ploughs, the travelling out of the soil at headlands is dispensed with, and there is no necessity for leaving even a single open furrow in the largest field—an advantage of much value where the harvesting is done by machinery. The work of reaping machines of the most approved description is far from being satisfactorily performed in fields ploughed on the ridge and open furrow system. Many owners of reaping machines have had to regret the consequences of their implements descending a trench and coming into contact with the opposing bank. Messrs Davey, Sleep, & Co.'s ploughs won over 100 prizes last year, including four silver cups and one medal.

MR FREDERICK SAVAGE'S SELF-MOVING ANCHOR AND LIFTING AND TURNING CULTIVATOR.

In connexion with Mr Frederick Savage's "Agriculturist" engine, may be mentioned his self-moving anchor, which is easy of draught, and most effective in holding against any necessary strain that can be put upon it. The self-lifting and turning cultivator is an implement of strong construction, yet light and easy of draught. It is self-lifting, and turns at the headlands in its own space, and tears up the ground in the intervals between headland and head in an unsurpassed manner. We give a cut (fig. 6) of this effective tiller of the soil, especially on the roundabout system.

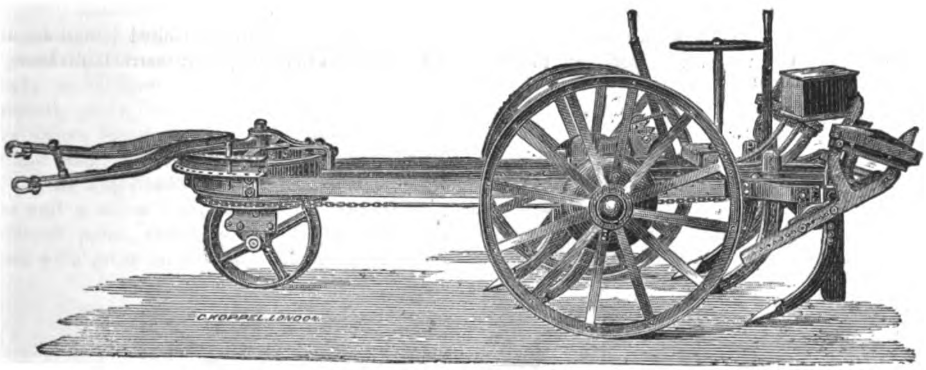


Fig. 6.—Mr Savage's Self-lifting and Turning Cultivator.

CLAY'S CULTIVATORS.

The cultivators manufactured by Mr Charles Clay, Stennard Works, Wakefield, like good wine, "needs no bush." Clay's cultivators and broadshares are remarkable for their strength, durability, efficiency of workmanship, and lightness of draught. These cultivators took all the first prizes at the Royal Agricultural Society of England's Show at Hull. Clay's cultivators are, in reality, a combination of broadshare, cultivator, grubber, and drag-harrow in one frame. They are fitted with a relieving motion, which is a great advantage, as the tines can easily be released by a lever when grating in stony soil. Tested by the dynamometer, Clay's cultivators shewed one-fourth less horse power draught than any other cultivators in the trial fields. Amongst numerous others who have written in their favour is that eminent agriculturist, Mr Clare Sewell Read, M.P. Clay's cultivator is without doubt a great economizer of labour, especially his chisel-harrow cultivator. Nothing can beat this implement for bringing couch grass to the surface; it also makes a beautiful seed-bed for barley on old ploughed land.

The cultivator goes on three wheels, which are chiefly required to regulate the depth of work; upon these is fitted a frame, within which strong bars work in carriages, being partly moved round at the operator's pleasure by the action of a lever and arms, the tines being fixed upon these strong bars with steel wedges. When the wedges or cutters are removed, the teeth can be taken off the bars, consequently their number may be increased or diminished at pleasure, and thus be made to suit any kind of work, a greater number being required for working barley and fallow land than for stubbles. The action of the lever is simple, and very easy to manage. When the implement is at work, the lever is in a catch or notch. Should the teeth or tines, however, become choked up with weed or stubble, and also when turning at the end of the "bouts," it is only necessary to remove the lever out of the catch, and then it can be raised to, or it will do so of itself by the forward motion of the horses, the teeth or tines turning backwards, and at once allowing the stubble, &c., to fall out.

Last year Mr Clay introduced into Wilts and Gloucester a new and very powerful cultivator, which he has named "Clay's Patent Wilts and Gloucester Cultivator." It is drawn by from four to six horses, according to the nature of the soil, and does its work very thoroughly. It is equally well adapted for the cultivation of soil in other counties, and we think it is a pity its title is so limited! (Fig. 7.)

We can with confidence recommend Clay's new chisel-harrow cultivator for spring and autumn cultivation. In this implement the alteration in the depth is effected somewhat differently from what it is in other cultivators; each side wheel being mounted on a lever with quadrant and pin, is easily altered during the progress of the work. A considerable advantage is obtained by the wheels being altered separately, as this arrangement enables the workman to drop a wheel into a furrow, and adapt it to hill-sides and other irregularities, and yet allow the implement to remain level—a thing impossible with chisel harrows altered by the old lever and rack acting on both wheels at once. It is a simple implement, and, while very strong, is yet particularly easy of draught.

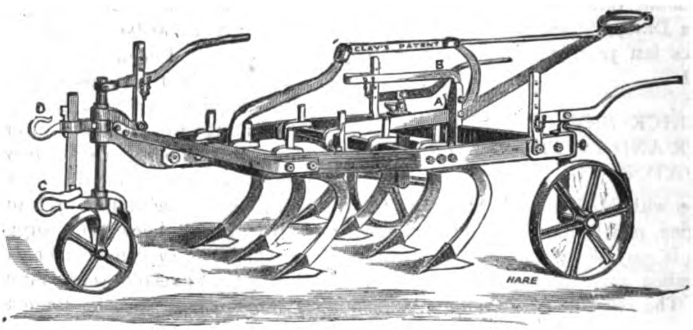


Fig. 7.—Clay's Patent Wilts and Gloucester Cultivator.

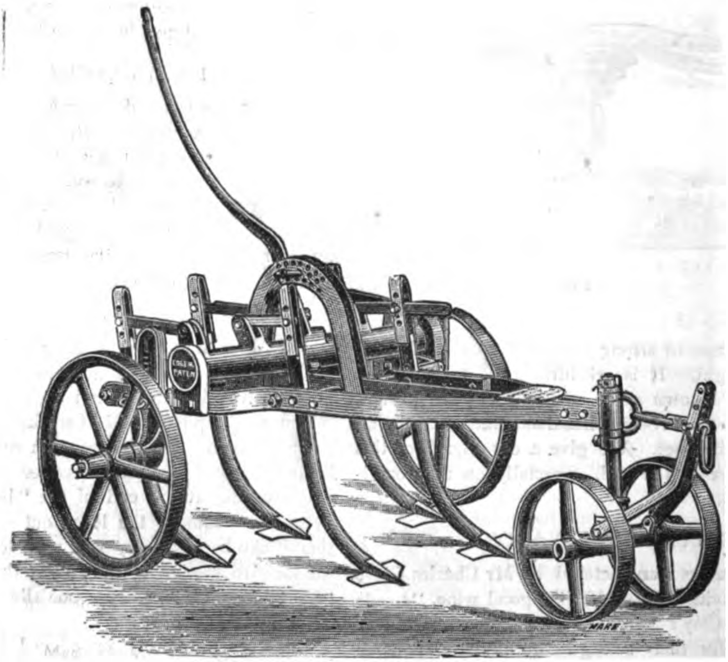


Fig. 8.—Messrs Coleman & Morton's Double Front-Wheel Cultivator.

MESSRS COLEMAN & MORTON'S CULTIVATORS.

The cultivators manufactured by Messrs Coleman & Morton, London Road Ironworks, Chelmsford, have stood the test of time, not alone in competitive trials in the fields in the United Kingdom and the Continent, where they have carried off more prizes than other makers, but what is more to the point, in the practical every-day work of the farm. They are strong, light of draught, and easy of management—liked by all who handle them. For spring cultivation they can be highly recommended, and in many districts they are superseding the plough. As broadshares, they are specially adapted for paring stubble after harvest. The shares are made by Messrs Coleman & Morton's patent process, which makes their wearing out no easy matter, and, therefore, they are very economical. Last season Messrs Coleman & Morton brought out a new and improved cultivator. In place of the single wheel and span iron or crutch, which in the other cultivators support the front part, the firm have adopted a pair of wheels, an arrangement which conduces to the steadiness of the implement. One of the wheels is pinned to a steel axle, the other being left loose. The axle is thus made to revolve in a suitable bearing of considerable length, thus preventing any wear in the bosses of the wheels. This arrangement lightens the draught. It should be noted that it can be readily applied to all sizes of Messrs Coleman's cultivators. (Fig. 8.)

MESSRS KELL, MEATS, & CO.'S SCARIFIERS.

The agricultural implements manufactured by Messrs Kell, Meats, & Co., Ross, Herefordshire, and Gloucester, are noted for the excellence of their material and skill in workmanship. Their ploughs are good, useful, clever-cutting implements, but we desire specially to mention here their combined scarifier, broadshare parer, or cultivator. This implement stands upon wheels 2 feet 8 inches high, with lever and cranked axle, for raising the tines at land's end. This implement, when fitted with a set of points and a set of hoes, answers the purpose of a broadshare parer, cultivator, or scarifier, and can be used with great success in breaking up lands for spring corn, making summer fallows, and paring stubble after harvest. It possesses an advantage in being always ready to travel from field to field, or to enter the ground from 1 to 10 inches deep, without the usual trouble and delay of having to alter its height on the wheels, the depth being regulated by hooking the regulating chain longer or shorter. The tines are made with double stems or stalks—a plan which gives them very great strength. The great disadvantage of tines with only one stem is that they are apt to give way if the ground is hard. This is not the case with Messrs Kell, Meats, & Co.'s tines, which do not bend in work. (See fig. 9.)

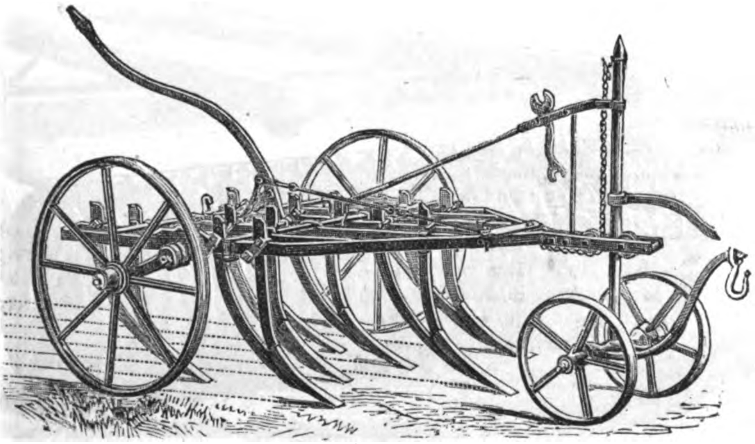


Fig. 9.—Messrs Kell, Meats, & Co.'s Scarifier.

STEAM PLOUGHING APPARATUS.

MESSRS FOWLER & CO.'S SUTHERLAND RECLAMATION PLOUGH AND DISCER.

Messrs John Fowler & Co., of Leeds, long famous for their steam ploughing machinery, have introduced a plough of a very peculiar type. Much has recently been written about the reclamation of land on the Duke of Sutherland's estate. The implement which we illustrate (fig. 10) is one of the chief agents in making that northern desert blossom like the rose. It is so constructed that the roughest land can be cultivated without trouble or serious breakage, or, indeed, it may be said, without breakage of any kind. It will be seen from the engraving that it is preceded by steel discs, which lift the plough over the stones or obstructions, so as not to break the mould-board. The plough will turn a furrow 2 feet wide by 15 inches deep completely over; and it will be observed that the turning of the furrow slice is not altogether effected by the mould-board, but is very materially assisted by the rollers, which catch it at the moment of leaving the plough. The stones which have been passed over are caught by the hook tine, which comes behind the plough, and torn out. They are then removed by men. The tine thoroughly subsoils the land to a depth of 2 feet, and materially assists the drainage of the soil.

Messrs Fowler & Co. have also brought out another very ingenious contrivance called a patent discer (fig. 11). This implement is intended to cultivate newly reclaimed soil without tearing up the solid furrow and bringing the turfy matter to the top; it does this most effectively, merely pulverizing the top to a depth of 3 or 4 inches, and it leaves the turf at the bottom to rot, and considerably reduces the expense of pulverization for a crop. In moss and grass land, its operation is invaluable, and it may be used with advantage in ordinary cultivation, but both plough and discer are specially adapted for steam.

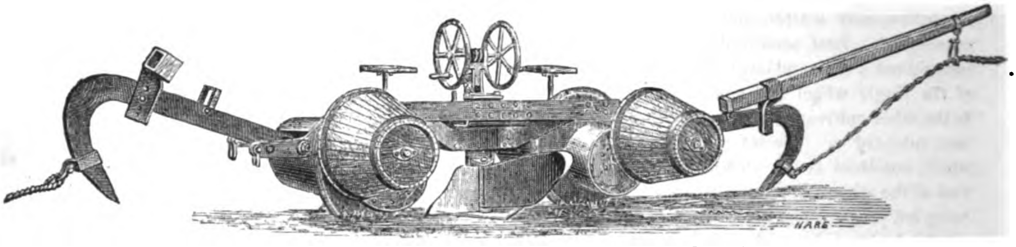


Fig. 10.—Messrs Fowlers' Sutherland Reclamation Plough.

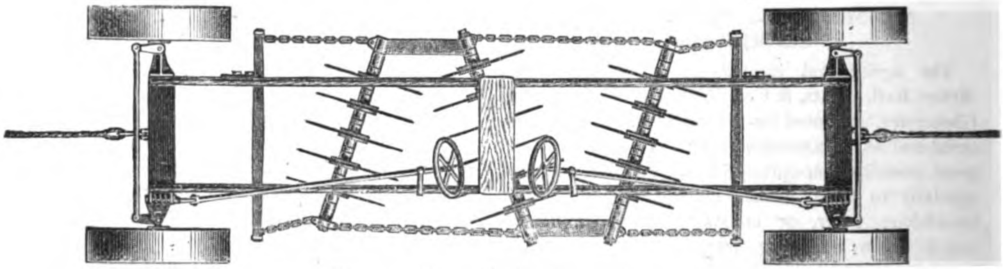


Fig. 11.—Messrs Fowlers' Patent Discer.

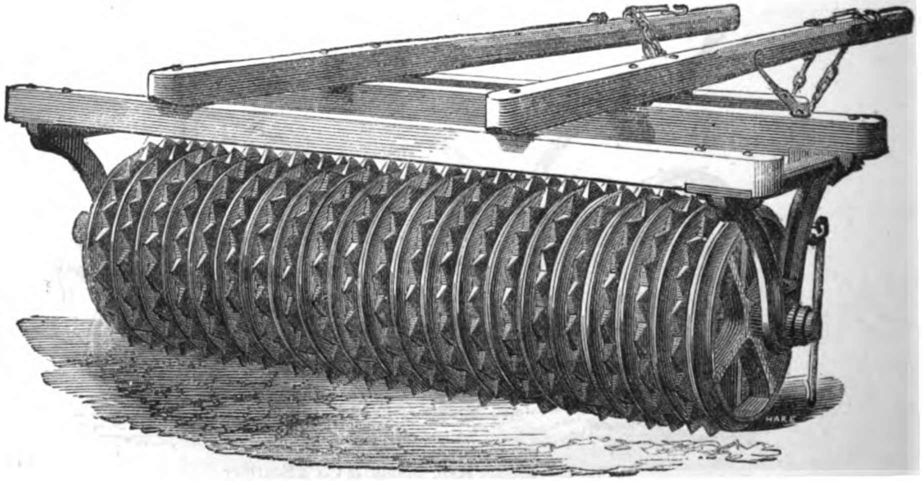


Fig. 12.—Messrs Newall & Ogilvie's Cambridge Roller and Clod-Crusher for New Zealand.

MESSRS NEWALL & OGILVIE'S CLOD-CRUSHERS.

Messrs Newall & Ogilvie, St Philip's Ironworks, Bristol, are the successors to Messrs Cambridge & Co., who were the best makers of clod-crushers that farmers ever knew. In the hands of Messrs Newall & Ogilvie, the reputation of the Cambridge clod-crushers has increased, as it might be expected to do under skilful hands. There is no land-roller that can better disintegrate the soil than that which comes from this Bristol firm. The hardest clod must give way to its insinuating, if rude, influence. No clod is so obstinate as to resist its penetrating thrust, and when once broken down to that fine condition which farmers designate "a nice seed bed," and the young seeds are springing up, the Cambridge roller passes over them and gently smooths the roots down, so as to prevent the ravages of those annoying insectivorous vermin which are sure to crop up when too much latitude is allowed them. Renewable bearings and grease boxes have been fitted to all the Cambridge rollers, and the castings have been strengthened; 2-inch ring rollers have been introduced, which produce a finer tilth than the ordinary 3-inch ones, and in some localities these are greatly appreciated. Speaking generally of the Cambridge rollers and clod-crushers, they are light in draught according to their effective weight, their construction is simple, and the material of which they are made of the very best. One great merit about them is that they are self-cleaning, by the introduction of a tiny serrated wheel between the plain ones. These serrated or notched wheels, are rather larger in diameter than the smooth wheels but the hole through which the spindle passes being likewise larger than in the plain wheels, all are level at the bottom, and exercise an equal pressure upon the ground. As the roller revolves, the part of the notched wheels which touches the ground gradually rises 2 inches above the plain ones and forces the indurate earth away, thus preventing clogging and reducing draught.

In new lands these Cambridge rollers have been much appreciated. New Zealand's virgin soils have felt their efficacy, and not less so those of Australia. We give a cut of the Cambridge press, wheel-roller, and clod-crusher (fig. 12) which is sent out to our brother agriculturists at the Antipodes. The firm also manufacture special rollers for Russia. The British one is too well known to need illustration.

HARROWS.

MESSRS W. N. NICHOLSON & SON'S NEW HARROW.

The harrowing of the land, next to ploughing it, is one of the most effectual operations that the husbandman has to undertake in the course of the year, for unless the seed is well covered over, it remains a spectacle for daws to peck at, and, what is worse, to swallow and leave barren the land. We think it will be interesting to our readers to give an illustration of this new implement from the Newark-on-Trent manufactory. Fig. 13 represents a portion of the harrow with one tooth fixed in position on their patent system. Fig. 14 shews the various parts of the same detached. It will be seen that the harrow teeth, C, are made with heads having a hollow on the under side to fit on the upper side of the cross bar, B; the beams, A, rest on the flat part of the heads of the teeth, and are encircled by a loop, D, which has slots in its lower ends for the cross-bars, so that on the wedge, E, being driven home, the beams and cross-bars are brought together, securely holding the teeth between them. By loosening the wedge, any one of the teeth can be taken out at pleasure for repairs or sharpening without disturbing the others, or having any nuts or bolts to unfasten. The advantages possessed by this patent arrangements are—1. No bolts or nuts are required; 2, no holes are made in the bars to weaken them; 3, greatly increased strength and rigidity; 4, any tooth can be taken out and replaced without taking the harrow to pieces; 5, all the parts are interchangeable; 6, the same harrow can be used with teeth of various kinds.

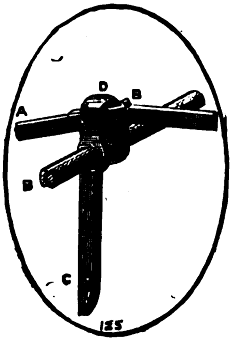


Fig. 13.—Messrs Nicholsou's Harrow shewing one tooth fixed in position.

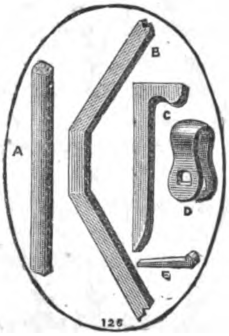


Fig. 14.—Messrs Nicholson's Harrow shewing the tooth detached.

MR H. DENTON'S NEW PATENT STEEL HARROW.

Mr Henry Denton, St Peter's Works, Wolverhampton, has long been celebrated for the make, lightness, strength, and efficiency of his harrows, of which something like 25,000 have been sold. His new patent steel harrow is a wonderfully good instrument, and as such has been recognized in the pages of the *Journal* of the Royal Agricultural Society of England. The teeth of many chain harrows are made of cast iron, which, although chilled, soon wears, and instead of having an effective penetrating point, shews nothing but a blunt, useless projection. Mr Denton's harrows, whose frames are of wrought iron, have chilled steel points shaped as a chisel. Instead of becoming blunter, they wear sharper as they work, and are very effective in getting up moss and fog in old turf land, or for dressing in soil or manure. For covering small seeds they act admirably, and they are very valuable for drawing over wheat just as the young weeds, poppies, wild mustard, &c., are coming up to light. (Fig. 15.)

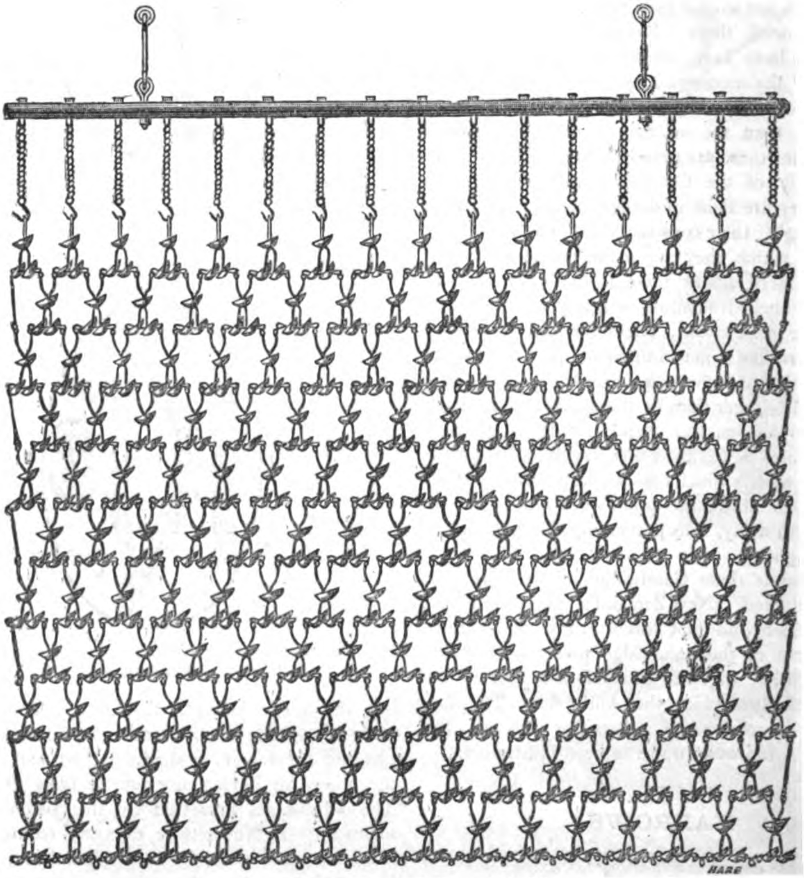


Fig. 15.—Mr Denton's Steel-tine Chain Harrow.

MESSRS NEWALL & OGILVIE'S HARROWS.

Messrs Newall & Ogilvie, St Philip's Ironworks, Bristol, manufacture chain harrows of an excellent type. Their patent tine and chain harrow is a very competent implement. It is light, effective, durable, and for grass lands it cannot be excelled. The expanding bars, or patent jointed spreaders, are wonderful improvements upon the inelastic iron bars in some chain harrows. In this combined tine and chain harrow the advantages are that short tines are used instead of longitudinal links. The tines possess more penetrating power, and are not so liable to clog. These harrows have stood A1 in the numerous competitions in which they have been tried. They make the rough surface smooth, they cover in the seeds after drill or broadcast sowing, brush harrow pasture land, and do not disturb the manure on land on which it has been ploughed down. Messrs Newall & Ogilvie also manufacture seed harrows, and duck-footed drags, scufflers, &c., under Seaman's patent. These "Excelsior" harrows are so constructed that the teeth are not liable to wear and tear. "The beams are set edgeways of the iron, thereby giving the greater amount of strength." A tooth broken can easily be replaced in the harrow by the tightening and unscrewing of a bolt. In a harrow of sixty tines only fifteen bolts are used.

MESSRS RANSOMES, SIMS, & HEAD'S SEED COVERER.

Messrs Ransomes, Sims, & Head have a novelty this year in the shape of a four-furrow seed coverer, intended for covering with soil seed which has been sown broadcast in order that it may, in its growth, come up in regular rows. The implement, it is explained, is also a good parer of stubbles. It is fitted with patent double lifting wheels, and, as may be seen from the illustration of the machine at work (fig. 16), a long lever for lifting it out of the ground and turning it at the headlands, which also regulates the depth. The seed coverer is fitted with cast-iron breasts and steel shares, which are set 6 inches apart, and it can be made to work from 2 to 4 inches in depth.

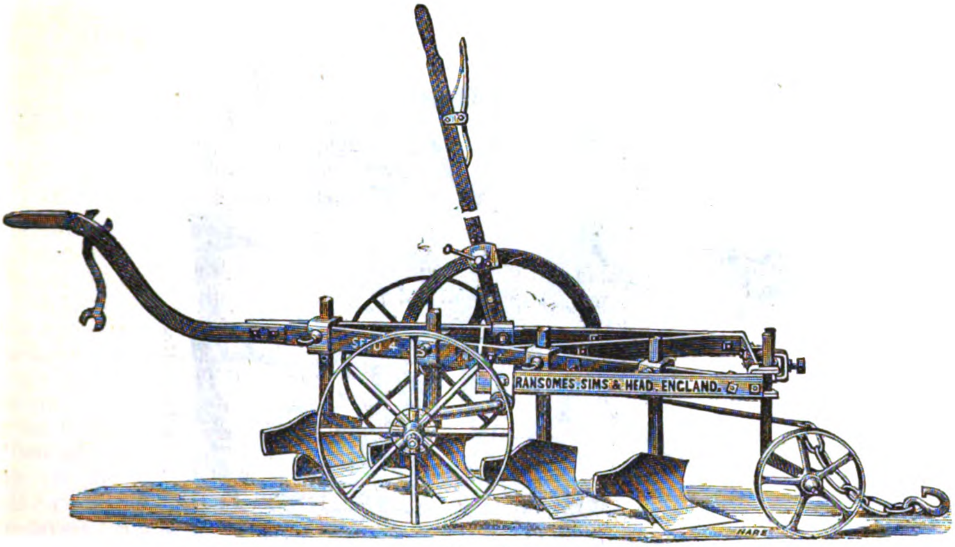


Fig. 16.—Messrs Ransomes, Sims, & Heads' Seed Coverer at work.

HORSE HOES.

MESSRS RICHARD GARRETT & SONS' IMPROVED LEVER HORSE HOE.

Messrs Garrett, Leiston Works, Suffolk, have greatly reduced the weight of their lever horse hoe. Another advantage of this hoe is that the framework is so arranged that the fore-steerage of the drill can be utilized for the horse hoe when required, whilst for stetch-work the horses can be worked on either quarter by means of shafts bolted to the frame. The lever by which the levers are raised is well within the reach of the steersman, who can hold the lifting lever in one hand and the steering lever in the other. The depth of every hoe blade can be separately regulated by means of stalks secured by wedges and set screws, and the "pitch" of the whole of the blades and the level of the lever bar can be adjusted to the greatest nicety by means of a simple lever arrangement on either side of the frame, as will be seen from fig. 17. The balance of the implement is accurately adjusted in order to reduce the draught to the minimum.

MESSRS DAVEY, SLEEP, & CO.'S HORSE HOE.

Messrs Davey, Sleep, & Co. have also a horse hoe that can with great safety be recommended to farmers, especially to those who cultivate light soil. The frame of this horse hoe, which is also a grubber, is made of wrought iron, and the lifters, or feet, are of cast steel, each of them easily movable to any depth or width by adjustable screws. The Royal Agricultural Society of England highly commended this implement, of which we give an illustration (fig. 18).

Messrs Davey, Sleep, & Co. can also attach to the horse hoe, by means of two bolts, simply and quickly done, a pair of breasts and frame, at once converting it into a banker or banking plough, making it a most complete and convenient implement.

CORN DRILLS AND TURNIP AND MANGOLD SOWERS, &c.

MESSRS J. G. ROLLINS & CO.'S GRAIN DRILL.

Messrs J. G. Rollins & Co., Old Swan Wharf, Upper Thames Street, London, have long taken a leading part in the implement trade. Their new corn drill, which they call the "Farmer's Friend," is very appropriately named, as it distributes the seeds evenly on the ground under any weather conditions. Some of the features in this drill, which are special, may be enumerated. First, we have the cone gearing which regulates the quantity of seed sown per acre without the necessity of loosening or removing any of the parts. By means of a cog gearing without loose wheels, the speed can be varied so as to suit the difference in strength or richness of the soil without stopping the horses. A double-force

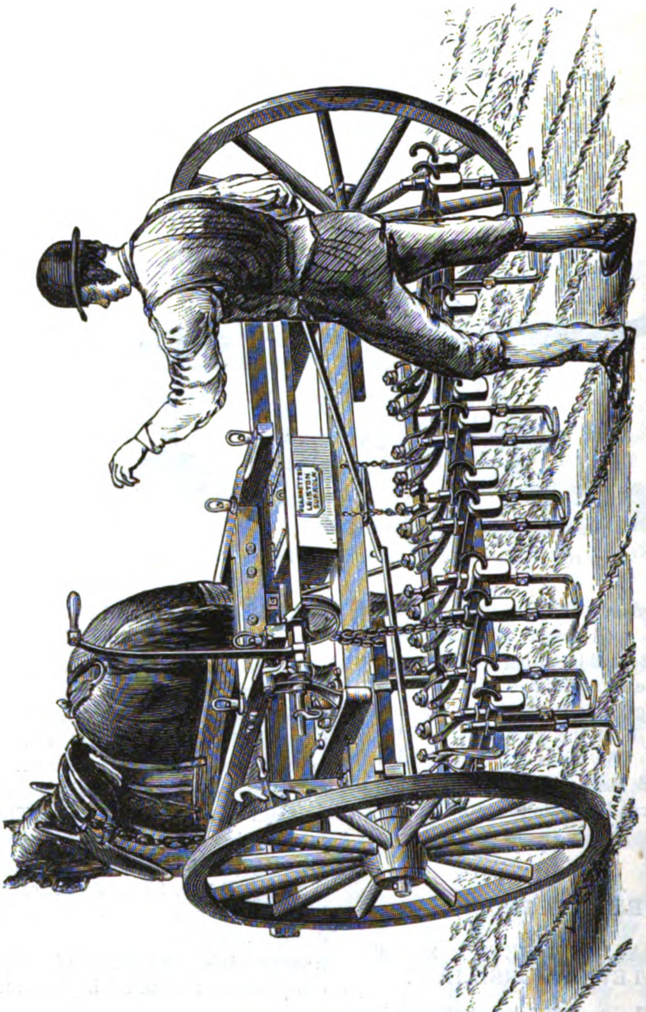


Fig. 17.—Messrs Garrett's Improved Lever Horse Hoe.

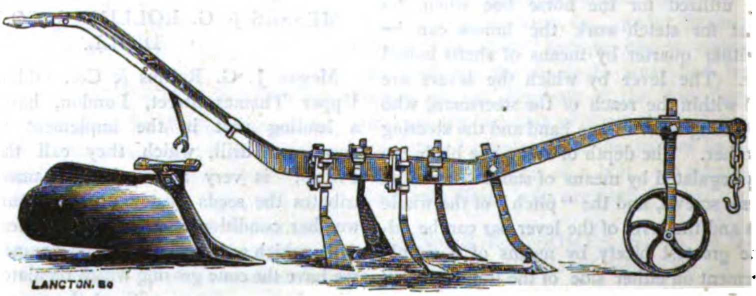


Fig. 18.—Messrs Davey, Sleep, & Co.'s Horse Hoe and Grubber.

eed insures the correct and even sowing of all kinds of grain, and a rear shifter effectually clears the coulter from all rubbish, so lessening draught. There is also attached to the drill a force-feed grass seeder, specially adapted for sowing grass seeds, and what is called a surveyor, a very useful contrivance for ascertaining the acreage sown over. This machine is constructed of the very best material, is extremely well finished, and not at all likely to get out of working order. It was awarded the medal for excellence at the Philadelphia Exhibition.

MESSRS KELL, MEATS, & CO.'S DRILLS.

Messrs Kell, Meats, & Co., Ross, Herefordshire, manufacture a splendid drill, which they call the "British Economical Drill," and it is appropriately named, being comparatively lighter than some others. It is easily worked by two horses and one man, whereas ordinary drills of a like size often require from three to four horses and two men. The easy draught in this machine is effected somewhat by the lightness of the drill, but mainly on account of the coulters being constructed with a natural draught into the soil as soon as the drill is in motion, without any pressure being necessary at the ends of the levers. The levers are made of steel, which possesses advantages over wood or iron; they break not, neither do they bend out of shape. They are light and elastic. By a clever arrangement of the joints, the seed-pipes are prevented from sticking or binding when in use. An improvement has been introduced in the seed barrel, the action being now stopped simultaneously with the raising of the coulters from the ground, so preventing the loss of seed. The drill can be had with either pole or shafts, the man driving with lines. At the land's end he stops the barrel, and the same movement raises the coulters, which remain up without any fastening until the attendant chooses to let them down again. Another advantage, and an important one, the patent British Economical drill possesses is that it forms a nice wide seed-bed in which the grain is well separated, leaving each plant room enough to grow properly. When fitted with the requisite barrel, this machine makes a capital one-horse drill for turnips. The coulters are arranged in two rows, which enables the drill to make excellent work on rough land, and the "couch" to pass without hindrance. It only requires a variation in barrels to secure by the British Economical a satisfactory drilling of clover, mustard, rape, and every kind of small seed. (Fig. 19.)

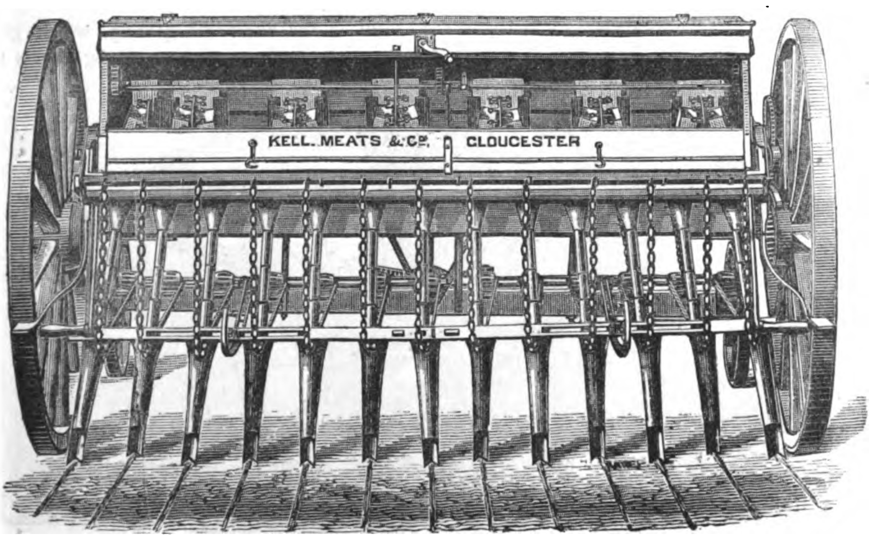


Fig. 19.—Messrs Kell, Meats, & Co.'s "British Economical" Drill.

MESSRS JAMES SMYTH & SONS' CORN DRILLS.

For more than three-quarters of a century the firm of Messrs James Smyth & Sons, Peasenhall, Suffolk, have been giving an undivided attention to the manufacture of this class of farm labour-economizing machines, and with unparalleled success both in this country and on the Continent. The main features in the well-known "Eclipse" drill are their lightness of draught and efficiency in working. The delivery barrel is so arranged that, although adapted for drilling small quantities, it will also drill large quantities without the necessity of a very quick speed, or the use of double tins when drilling Peas or Beans. The slides for regulating the flow of grain to the cups rise all at once. The box is so formed that extra tins are never required for drilling out seeds to a small quantity. The levers are of wrought iron, well and strongly made, and so connected to the coulters that wrought-iron coulter stalks are never required, and extra expense saved. The coulters have also an improved shape; thus, while retaining the former penerating power, they clear themselves from rubbish much more freely, but the telescopic conductor prevents any waste or unevenness in seeding. But perfect as the Eclipse is, Messrs Smyth & Sons in their Nonpareil (fig. 20), to which was awarded a medal at the International Show at Paris, have introduced several manifest improvements; for instance, patented hoppers, which do not require to be removed when the cup barrel has to be taken out of the box; new bearing supports, which drop the moment the cup barrel has to be removed; and an important improvement in the cog-wheel gearing, which gives more variation in seeding with eight cog-wheels than previously could be obtained with twelve. At a slightly enhanced cost, there is a cog-wheel attachment for hilly land.

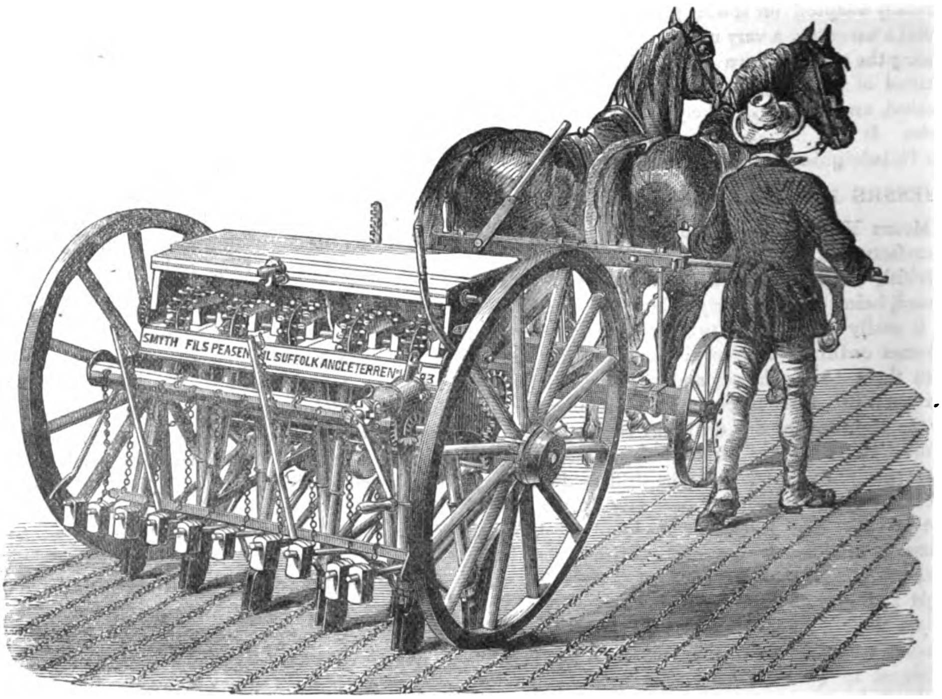


Fig. 20.—Messrs Smyth & Sons' "Nonpareil" Corn Drill.

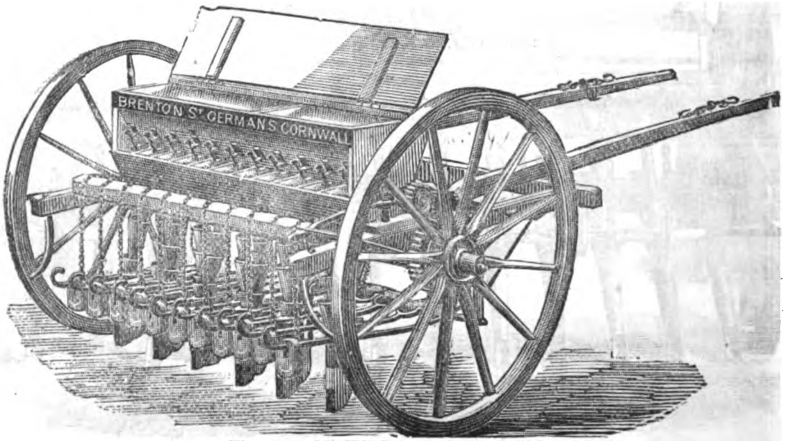


Fig. 21.—Mr W. Brenton's Corn Drill.

MR W. BRENTON'S CORN DRILLS.

At the Royal Cornwall Show in 1877, Mr W. Brenton, East Cornwall Implement Works, St Germans, gained a silver medal for his corn drills, which are light and easy of draught, yet strong, being fitted with wrought-iron levers and hammered coulter stalks with steel points. The levers act independently, and are lifted at the headland by an eccentric frame; with just one pull of a lever handle, all the coulters are raised to any desired height, a great improvement over the old windlass lift. The seed is discharged by a notched roller, which brings the corn in a regular stream to the openings which are in the side of the box. The openings are regulated by a slide, and adjusted instantly—a great advantage over cup drills, as the speed of the horses on hill-side land does not interfere with the regularity of the sowing. (Fig. 21.)

MESSRS RICHARD GARRETT & SONS' CORN DRILLS.

Messrs Garrett, Leiston Works, Suffolk, have long been celebrated for their corn drills. On large occupations they may be said to be *facile princeps.* They have recently introduced a new one for small occupations. This drill is strong and substantial. The seed conductors are efficient in action, and more durable than those of telescopic form. A drill spreading 6 feet between the travelling wheels, fitted with wrought iron levers for sowing fifteen rows and furnished with fore carriage steerage, only weighs about 10 cwt., so that the draught is very light. (Fig. 22.) The horses pass along any kind of land with the greatest of ease, to use a common expression, "not a hair of their coats being turned" at the close of a good day's "darg."

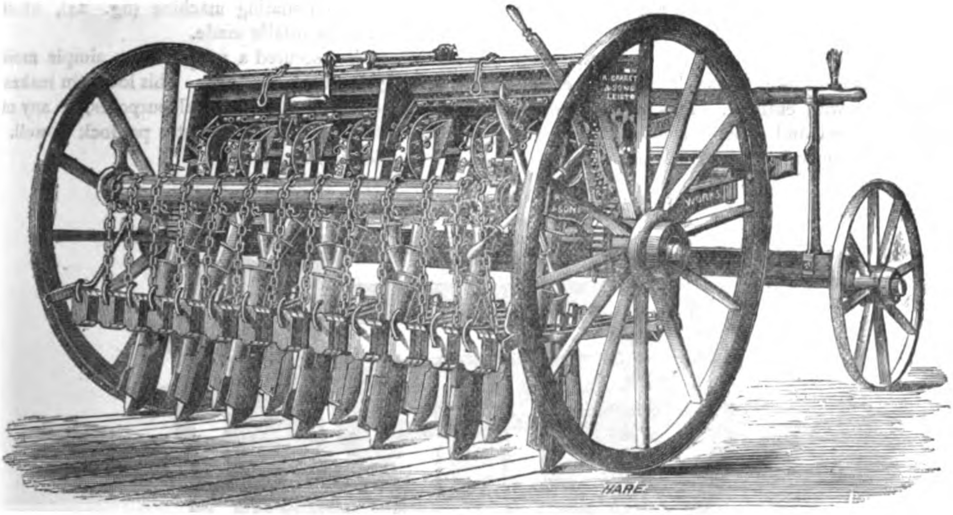


Fig. 22.—Messrs Garrett's Improved Corn Drill for small occupations.

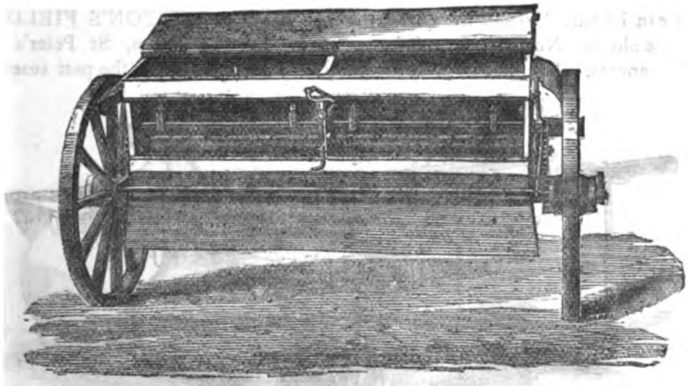


Fig. 23.—Messrs Kell, Meats, & Co.'s Broadcast Manure Distributor.

MESSRS KELL, MEATS, & CO.'S BROADCAST MANURE DISTRIBUTORS.

Messrs Kell, Meats, & Co., Ross, Herefordshire, have brought out a first-class broadcast manure distributor constructed upon the best principle. It consists of a wood barrel and revolving stirrers for delivering the manure, and is so made as to bring the least possible amount of iron in contact with the manure, thus preventing corrosion and breakage. Scrapers and lateral stirrers (which are sources of endless trouble and annoyance to those who use them) are superseded and done away with entirely. This machine distributes ½-inch bones and other manures from 2 cwt. per acre to any quantity required, and is so easily altered that the quantity can be varied to suit the quality of the soil, as it moves along. No extra barrel is required for rough manures. We give an illustration of this machine (fig. 23), which proves a very useful one on the farm.

MR W. BRENTON'S GENERAL PURPOSE DRILLS.

The general purpose drills manufactured by Mr W. Brenton. combine the efficiency of the corn drills with those of the turnip, mangold, and manure drills, "and will sow manure broadcast with or without the corn, or in rows with the roots." We give an illustration of this accommodating machine (fig. 24), which is well and substantially made.

W. B. has secured a patent for a simple mode of locking the sheets together. This lock-pin makes the best door-bolt for agricultural purposes, or any other door where you desire to put a padlock as well. It is simple and cheap.

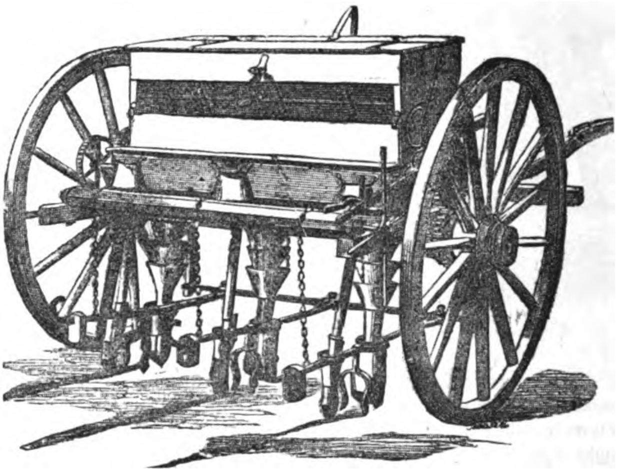


Fig. 24.—Mr W. Brenton's General Purpose Drill.

MR H. DENTON'S FIELD ROLLERS.

Mr Henry Denton, St Peter's Works, Wolverhampton, has, during the past season, brought out a new and greatly improved field roller. In the old style of rollers the centre, on account of the grit

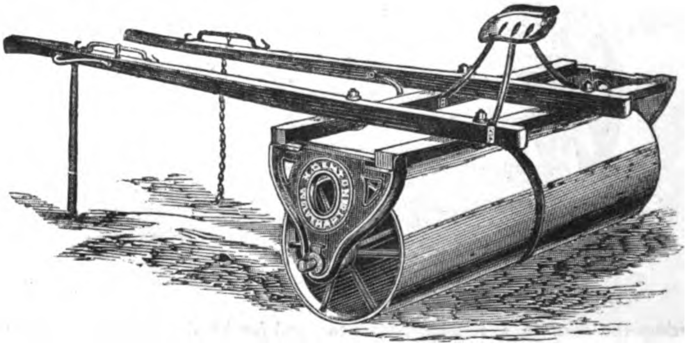


Fig. 25.—Mr H. Denton's Improved Field Roller.

getting in, soon wears out, and a new end cannot be replaced under a cost of something like £3 in all. Mr Denton's improvement is that he bushes the centres, making the outside of the bush of hexagonal orm, the inside, of course, being round for the spindle to revolve in. These bushes, when worn out, can be supplied at 1s. 6d. each, and can easily be replaced by any farm labourer. (Fig. 25.)

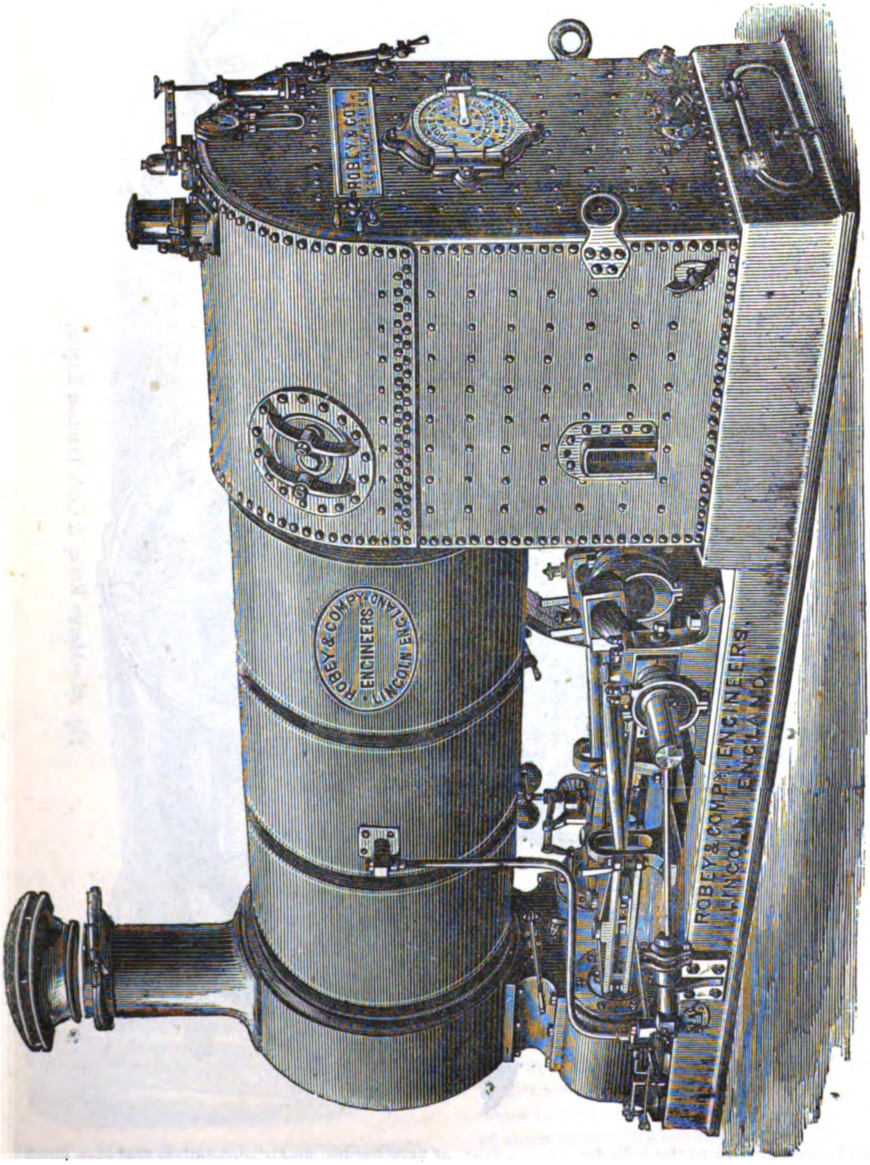

ROBEY & CO.
ROBEY & COMPANY ENGINEERS LINCOLN ENGLAND
ROBEY & COMPY ENGINEERS LINCOLN ENGLAND

Fig. 26.—Messrs Robey & Co.'s Fixed Engine.

STEAM ENGINES AND OTHER MOTIVE POWER.

MESSRS ROBEY & CO.'S STEAM ENGINES.

The engines of Messrs Robey & Co., Lincoln, possess the merit, in the first place, of being made out of the best material—that is the foundation of their success in the manufacture of steam engines. These engines are strong in all parts, and are so designed that valves are open to inspection by removing one cover only. The working parts are few, and so carefully marked, that an ordinary farm labourer can take them to pieces and re-arrange them without any difficulty whatever. Great economy of fuel is secured by the use of steam jackets to the cylinders, expansive working of the steam heating feed-water and fire-box giving out large heating surface. The safety of the boilers is secured, so far as it is possible for human foresight to do, by a severe system of testing, both by hydraulic pressure and steam, and providing them, in addition to the ordinary fittings, with extra safety valve under lock and key, to prevent over-pressure, and fusible plug in fire-box, on the melting of which the fire is instantly extinguished should the water ever be suffered to get low. Messrs Robey & Co.'s fixed engine, which we illustrate (fig. 26), has the advantage of easy fixture, and it economizes fuel very much. As will be seen, the entire engine is erected on a massive cast-iron bed-plate, so that the boiler is relieved of all strain due to the engine, and is confined to its legitimate purpose—that of raising steam. The base-plate is formed at one end into an ash-pit, with damper

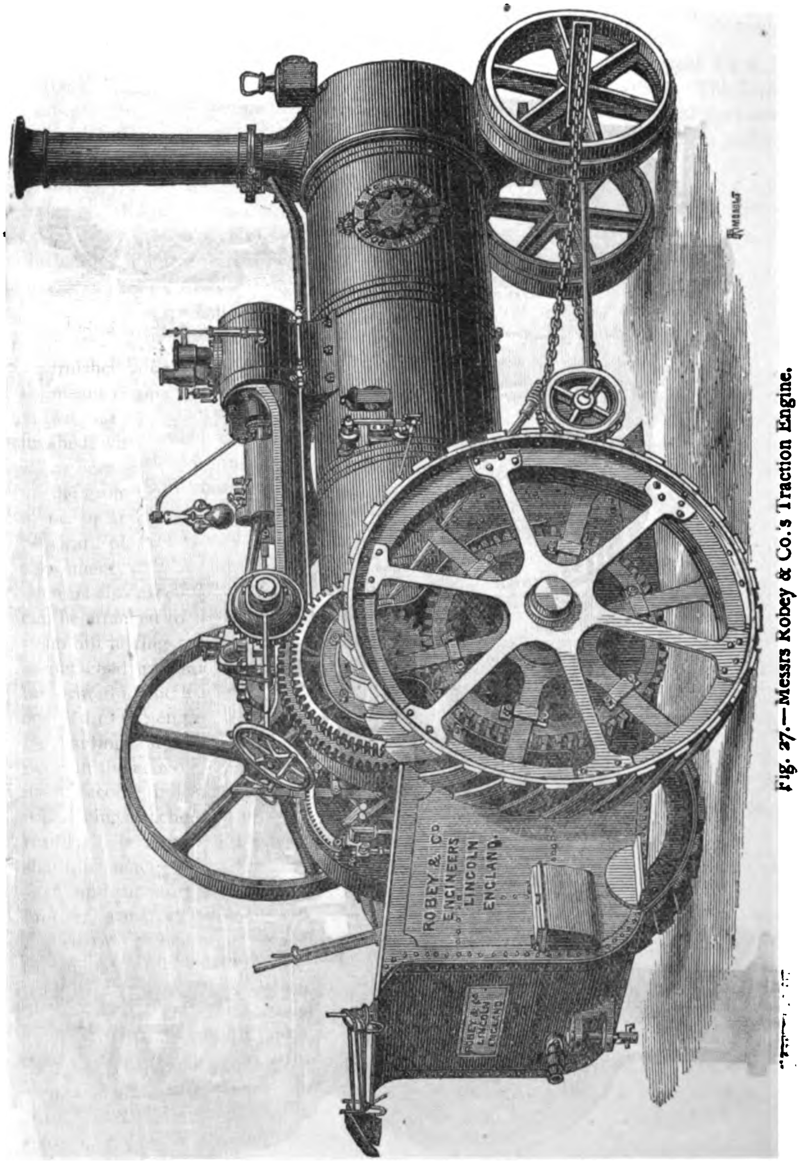


Fig. 27.—Messrs Robey & Co.'s Traction Engine.

doors, and is made suitable for receiving the fire-box end of the boiler—the other end of which is carried by a crutch-shaped casting fixed over the cylinders. The end of the base-plate under the cylinders is made as a feed-water tank, into which the cylinder cocks discharge all condensed water, and into which a portion of the exhaust is so directed as to heat the feed-water to nearly boiling point before going into the boiler. The whole of the parts of both engine and boiler is included on one foundation or base-plate, heavy and expensive foundations being dispensed with—the weight of the boiler and its contained water acting as an extra weight to assist in keeping the whole machinery in rigid position.

THE "ROBEY" TRACTION ENGINE.

The traction engines—or road locomotives—manufactured by Messrs Robey, Lincoln, are remarkable for strength, simplicity, durability, and efficiency—the engine, boiler, and gear being each complete in itself, and so simple in combination that any intelligent labourer can take the whole apart when necessary, and connect them again in a few hours; every part of the engine being made accurately to template. This engine is not only self-propelling—moving itself and its accompanying machinery from place to place—but it is also calculated to do all the work of the farm, such as ploughing, thrashing, sawing, &c., and when not employed at farm work, can be used for hauling heavy goods on common roads, for which work it will be found a very economical substitute for animal power. Its consumption of fuel is very small on account of the boiler having ample heating surface and steam room. Frequently a day's work can be accomplished with a consumption of only 4 cwt. of coal. It is easy of management, the whole of the levers being skilfully and conveniently brought together, so as to be under the control of one man. A patent steerage system enables the driver, with little exertion, to steer in any direction. A differential motion is introduced into the driving gear, by means of which, when turning a curve, one of the driving wheels is accelerated in the same proportion that the other is retarded; thus the sharpest curve can be turned without anything being thrown out of gear, or any strain being put upon the engine. The engines can also be fitted with fast and slow speeds when required. (See fig. 27.)

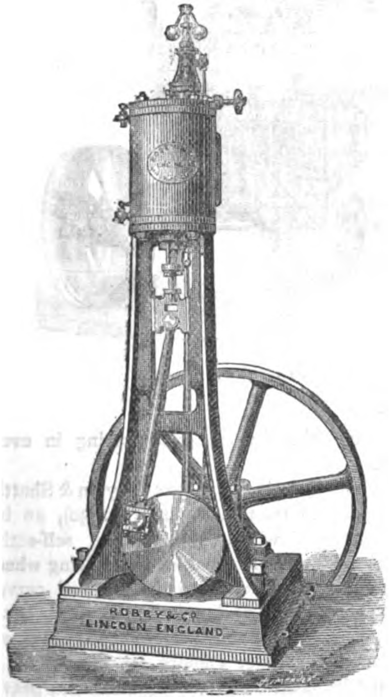


Fig. 28.—Messrs Robey & Co.'s Vertical Engine.

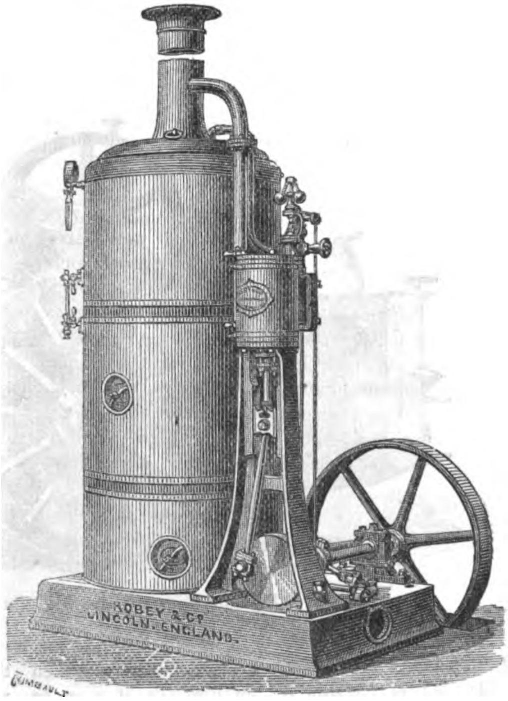


Fig. 29.—Messrs Robey & Co.'s Vertical Engine and Boiler Combined.

Messrs Robey & Co. also manufacture Vertical Engines of the very best type. The circulation of the water in the boiler is perfect, and thus the generation of steam is not only facilitated, but incrustation effectually prevented, which is a most important point. The circulating tubes being straight, permit any mud which may be in suspension to fall freely through them when steam is down; therefore they are always perfectly clean. The flue tubes are so arranged that the product of combustion on its way to the chimney must strike upon and pass around the water tubes, thus breaking the continuity of the flame and abstracting therefrom the maximum heat, which means economy of fuel. (See figs. 28 and 29.)

MESSRS CLAYTON & SHUTTLEWORTH'S ENGINES.

Messrs Clayton & Shuttleworth, of Lincoln, have now devoted special attention to steam engines for the last thirty years, and with marked and unvarying success. Their portable steam engines of varying horse power are almost as well known, and quite as well appreciated, on the Continent, America, and in the Colonies as they are in the United Kingdom. No portable engine has had a better run, as may be understood from the fact that nearly 17,000 have been sold. Messrs Clayton & Shuttleworth, it may be said without disparagement to any other firm, rank among the first, if not the very first, of portable steam engine manufacturers. In the course of a long and honourable career they have taken, at all the principal agricultural expositions at home and abroad, a wonderfully long list of first prizes for their steamers, and for other valuable machines (which will be referred to under their respective heads) adaptable for all purposes to which steam can be applied on the farm. The features in their steam engines are precisely those which are desiderated in such construction—simplicity, lightness, strength, aud durability, with moderation in cost. This firm has paid particular attention to a point of great importance in portable and road locomotives, viz., to the due proportions between the engines and the boilers. The engines are of suitable dimensions for developing more than double their nominal power while running at moderate speed, and the boilers have ample heating surface for the generating of steam in excess of the requirements of the engine, with moderate firing, and consequent economy of fuel. The capacity and heating surface of the boiler, and not the diameter of the cylinder, are the most material elements in estimating the power of an engine. Messrs Clayton & Shuttleworth's portable engine boilers will evaporate sufficient steam for developing three times the nominal power, if requisite, without excessive stoking. Every portion of the engine and boiler is composed of the best materials, and fitted with the newest appliances for economizing steam, which, of course, means conservation of force, therefore a great saving in every particular.

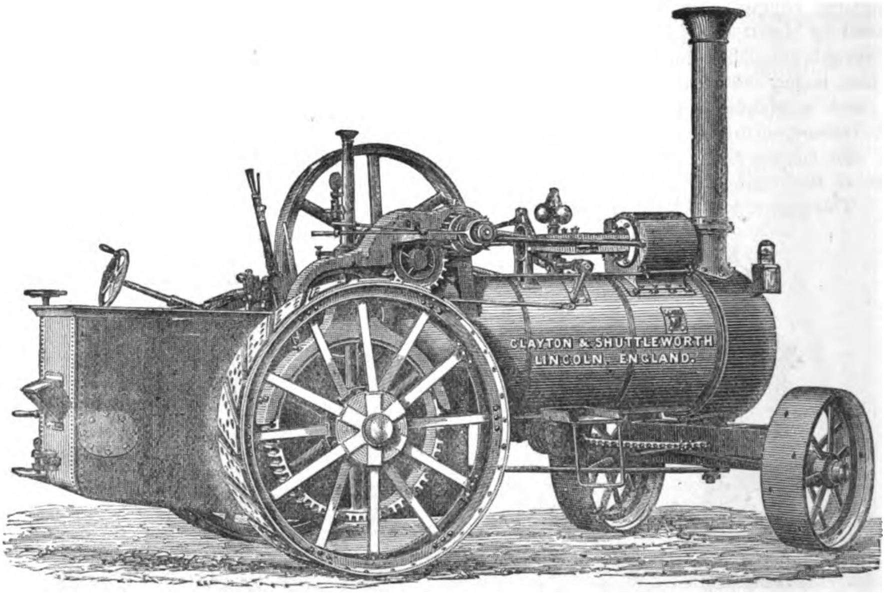


Fig. 30.—Messrs Clayton & Shuttleworth's Traction Engine.

We give an engraving of Messrs Clayton & Shuttleworth's improved traction engine (fig. 30), an important feature of which is the patent self-acting differential motion, which enables the driving wheels to accommodate themselves to the sharpest curves, without strain or loss of power; both wheels at the same time are kept in gear, and receive the full power from the engine. These engines are constructed to work at 100 lb. pressure on the square inch; geared to travel at two different speeds; fitted with steam-jacketed cylinder, patent wrought-iron crank shaft brackets stayed by rods to the cylinder, reversing link motion, hind-steerage, brake, safety-valves, steam pressure gauge, signal whistle, complete set of wrenches, firing tools and shovel, screw hammer, lamps, signal flag, bucket, ladder, waterproof cover, and all requisites for travelling on common roads. The travelling wheels are made of wrought-iron of large diameter and breadth, and provided with appliances for giving a proper hold on soft or hard ground. The tender carries an ample supply of coals and water. All the working or wearing parts of the engine, such as the side bars, link motion, governors, cross-head gudgeon, nuts and screws, &c., have steeled surfaces, and every improvement suggested by practical experience has been adopted, making it a very perfect and efficient traction engine. In accordance with Acts of Parliament, the name and address of the purchaser, and the weight of the engine, are painted upon it.

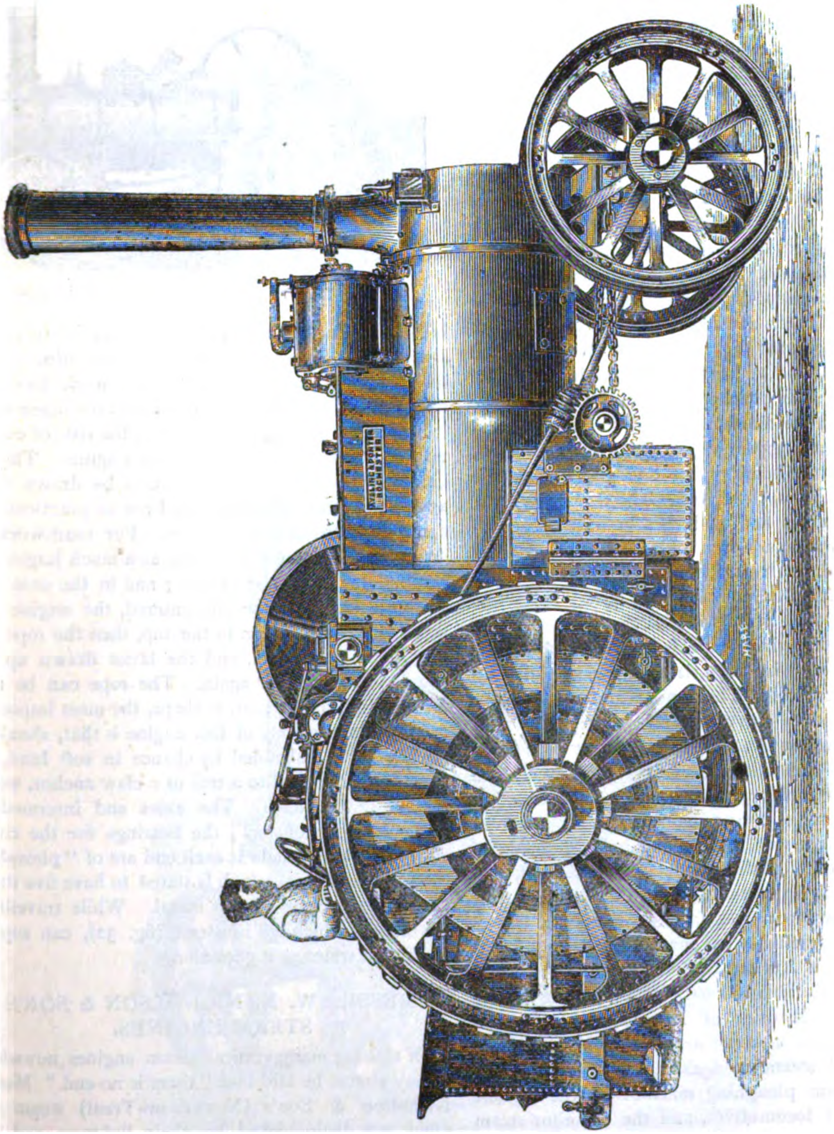


Fig. 31.—Messrs Aveling & Porter's Road Locomotive Engine.

In many foreign countries, the absence of coal, wood, or turf has operated greatly against the use of the portable engine, the cost of procuring fuel from long distances being very great. By the application of their patent furnace to the ordinary portable engine, Messrs Clayton & Shuttleworth have obviated this disadvantage. By this ingenious apparatus, steam can be generated by cotton, maize stalks, reeds, &c., and straw—in fact, almost by any vegetable substance—without injury to the machine. After many experiments, this patent has been brought to such economical perfection, that corn can be thrashed with the consumption of about half the quantity of straw required by any other apparatus hitherto introduced for the purpose.

MESSRS AVELING & PORTER'S ROAD LOCOMOTIVES AND STEAM ROAD ROLLERS.

We scarcely think it is necessary to make many remarks about these engines. Macadam has not yet been surpassed in road-making. Let French and Germans talk as they may about their wood and their composite, so far as we have seen, the roads put down with broken stones, and rolled in by Messrs Aveling & Porter's rollers, have lasted longer than others placed down by wood and tar. Messrs Aveling & Porter's traction engines have done effectual work where other engines have been in difficulties—Wolverhampton, for instance. Their engine, specially designed for agricultural purposes, is particularly adapted for its purpose. Their new road locomotive, of which we give an engraving (fig. 31), has its steam-jacketed cylinder placed on the front part of the boiler. The patent crank shaft brackets are formed out of the side-plates of the fire-box extended upwards and backwards, carrying the crank shaft, counter shaft, and driving axle bearings, in one plate. Leakage from bolts is thus avoided, &c. The driving wheels, 7 feet in diameter and 16 inches in width, are constructed of wrought T-iron of a new and specially strong section, with steel diagonal plates. When engines are required to work over paved roads, the driving wheels are fitted with Adams' patent spring tires. A winding drum capable of holding 100 yards of ¾-inch steel wire rope, is fitted to the driving axle when required. The tender and water tanks are constructed to carry an extra supply of water. An injector, water elevator, with 26 feet of suction hose, lamps, and other necessary tools, &c., are supplied with each engine free. The compensating gear wheels are of larger diameter, and made from the best crucible cast steel. The boiler is made of best quality of Yorkshire iron, double riveted, and capable of working at a pressure of 150 lb. The fire-box is of Low Moor iron, fitted with stays, 4 inches apart. The speed in this machine can be readily altered. Messrs Aveling & Porter were very successful at the Paris Exhibition of 1878, getting special award by the Minister of Agriculture for steam ploughing (as an *objet d' art*); a gold medal for application of steam to agricultural works; silver medal for steam ploughing machinery; the highest prize for road locomotives, and the same for steam road rollers.

MESSRS J. & H. M'LAREN'S TRACTION ENGINES.

Messrs J. & H. M'Laren, of the Midland engine works, Leeds, gained a gold medal for their traction engine at the Highland and Agricultural Society's Show at Dumfries last year (1878). This is no mean distinction, as the judges of the mechanical department of the principal Society in Scotland are skilful men. Messrs M'Laren's 6- and 8-horse power engines are now fitted with a winding drum on the main axle, which is furnished with a steel wire rope 50 yards in length. By means of this rope the thrashing machine can be drawn out of the stack-yard, after work has been finished, without taking the engine off the place where it has been standing, thus avoiding the risk of cutting up the ground by the wheels of the engine. The machine, or traction wagons, may also be drawn out of awkward places, where it would not be practicable or convenient to take the engine. For road-work the drum is also exceedingly useful, as a much larger load can be attached to the engine; and in the case of a steep hill having to be encountered, the engine may be detached and taken to the top, then the rope can be secured to the load, and the latter drawn up and coupled to the engine again. The rope can be used for hauling timber; or, perhaps, the most important point in the economy of this engine is that, should it itself become imbedded by chance in soft land, the rope, being attached to a tree or a claw anchor, would readily relieve itself. The axles and intermediate shafts are made of steel; the bearings for the crank shaft and the journals at each end are of "phosphor-bronze," a material which is stated to have five times the wearing power of gun metal. While travelling, the engine, which we illustrate (fig. 32), can supply itself with water as it goes along.

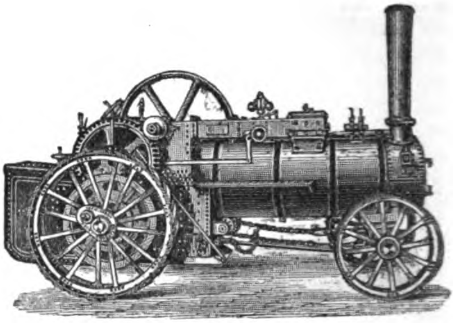


Fig. 32.—Messrs M'Laren's Traction Engine.

MESSRS W. N. NICHOLSON & SON'S STEAM ENGINES.

Of making many vertical steam engines nowadays it may almost be said that "there is no end." Messrs Nicholson & Son's (Newark-on-Trent) steam engines are distinguished by their lightness and for the independence of the engine from the boiler when required. By this arrangement (or convenient disarrangement shall we call it?) of engine and boiler, Messrs Nicholson & Son have secured freedom of wear and tear upon both engine and boiler from vibration, strain, and variation of temperature, which are inevitable in all cases where the two do not act independently. The only connexion between the engine and boiler on Messrs Nicholsons' system are the steam and pump pipes. Hence, for repairs, the boiler can be detached at once, without interfering with the engine, and the arrangement, as it necessitates a broader base, renders the engine perfectly steady in work. The gines are not particular as to the food they are fed by. They are content with peat, sawdust, coke, and other inferior fuel, but of course they prefer coal best.

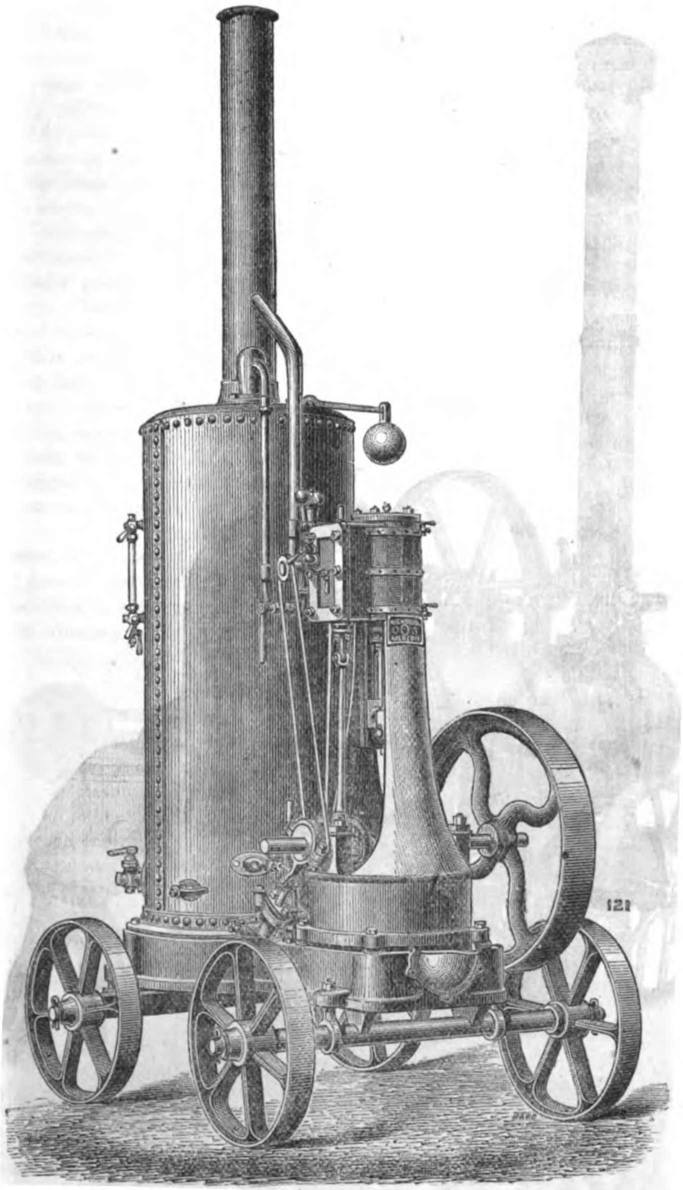


Fig. 33.—Messrs Nicholson & Son's Inverted Cylinder Vertical Engine.

Engines and boilers supplied together are mounted independently upon a tank bed-plate, which is constructed to serve as a feed-water heater. The feed pumps are continuous in their action, the engine self-contained, and all parts are made to template, so that, in case of accident to any one part, it can readily be replaced. We give an engraving of Messrs Nicholson & Son's inverted cylinder vertical engine (fig. 33) mounted on wheels.

MESSRS HORNSBY & SONS' STEAM ENGINES.

Messrs Hornsby & Sons' (Spittlegate Ironworks, Grantham) steam engines have been favoured by the careful judgment of those who were deputed to give awards at shows too numerous to mention, both at home and abroad. They deserved the honours they obtained. These engines are well made out of the best material, and the fire-boxes are constructed so as to burn any material—coal, wood, or straw, it matters not which. The boilers are of the best Lowmoor iron. Steam-jacketed cylinders are upon all the engines. Messrs Hornsby & Sons have an engine specially designed for large Continental fields. It is simple in its arrangement for burning straw. (See fig. 34.)

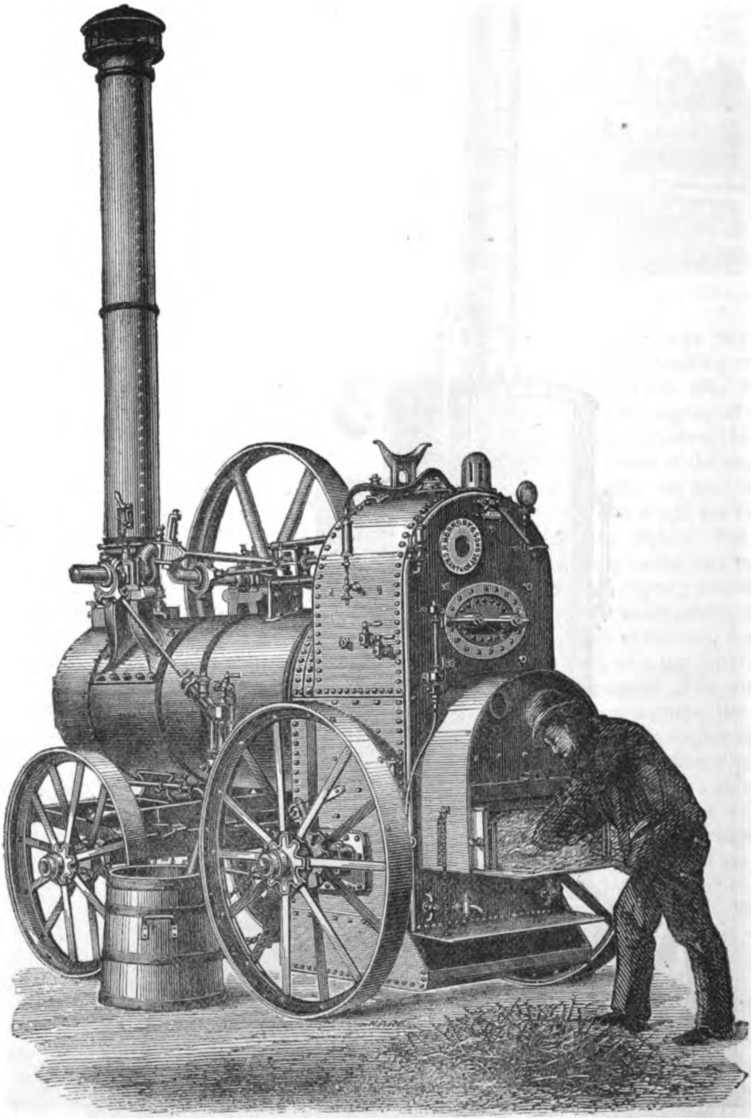


Fig. 34.—Messrs Hornsby's Steam Engines.

MESSRS RICHARD GARRETT & SONS' STEAM ENGINES.

Messrs Garrett, Leiston Works, Suffolk, have been manufacturers of portable steam engines for a very long time. The Leiston firm was about the first in the field. What they claim for their manufacture in portable engines are careful selection in the materials of which they are constructed, good workmanship, and economy in fuel and water. The latter saving is effected by "the employment of a very simple and ingenious slide valve, by means of which the steam is used expansively without involving back pressure or additional friction. By the use of the feed-water heater, constructed on the principle of 'The Lateral Induction of Fluids,' a large proportion of the exhaust steam is returned to the feed-water supply, and a very appreciable saving of water as well as of fuel is the result." Messrs Garrett do not believe in steam-jacketing cylinders with a short stroke, and assert that simplicity of construction and portability "of the engine are grossly violated for the sake of a supposed economy of fuel, which is not in reality effected or obtained." We give a cut (fig. 35) of their single cylinder portable steam engine, fitted with iron road-wheels. These engines are constructed with machine-flanged boilers and corrugated fire-boxes—arrangements which, in the opinion of competent engineers, save much fuel.

The Improved Spark Arrestor, the invention of Mr Graham, of Stockholm, and applied to Messrs Garrett's engines, is well worthy the attention of farmers, as it entirely obviates danger from fire in the stack-yard by a spark falling from an engine driving a thrashing machine.

The spark arrestor, which we illustrate (fig. 36), consists mainly of conical and annular baffle plates, made of light malleable iron, and fixed within a conical enlargement of the chimney. The principal dimensions are given on the drawing, which clearly illustrates the apparatus as applied to 8- and 10-horse power engines. The cooled sparks which collect in the open space below the inverted cone are from

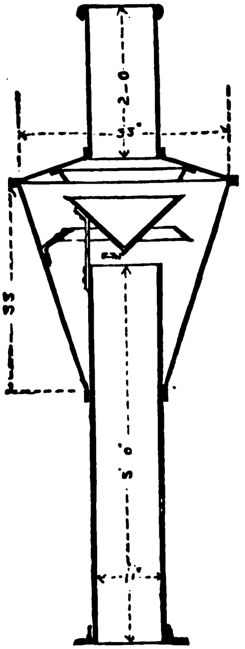


Fig. 36.—Messrs Garrett's (Graham's) Spark Arrestor.

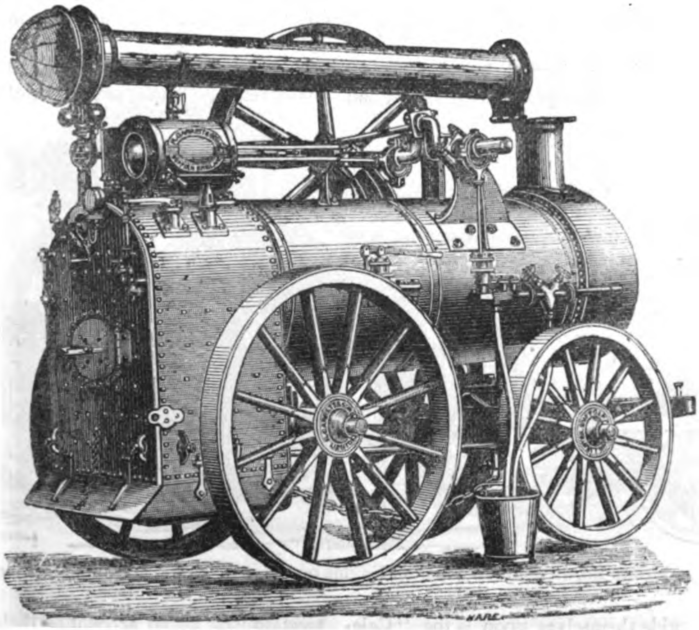


Fig. 35.—Messrs Garrett's Single Cylinder Portable Steam Engine, fitted with iron road-wheels.

time to time removed through small hand-holes made for that purpose.

MESSRS ALEXANDER SHANKS & SON'S VERTICAL ENGINE.

Messrs Alexander Shanks & Son, Den's Ironworks, Arbroath, and 27 Leadenhall Street, London, turn out from their foundry engines of a first-class character. They are remarkable for their easy working power. Their hoisting engines, their steam cranes, and deck winches have been proved very useful, and what they now pride themselves upon is the "Caledonian" horizontal engine, not so much upon its novelty as upon the excellence of workmanship and the lowness of price. (Fig. 37.)

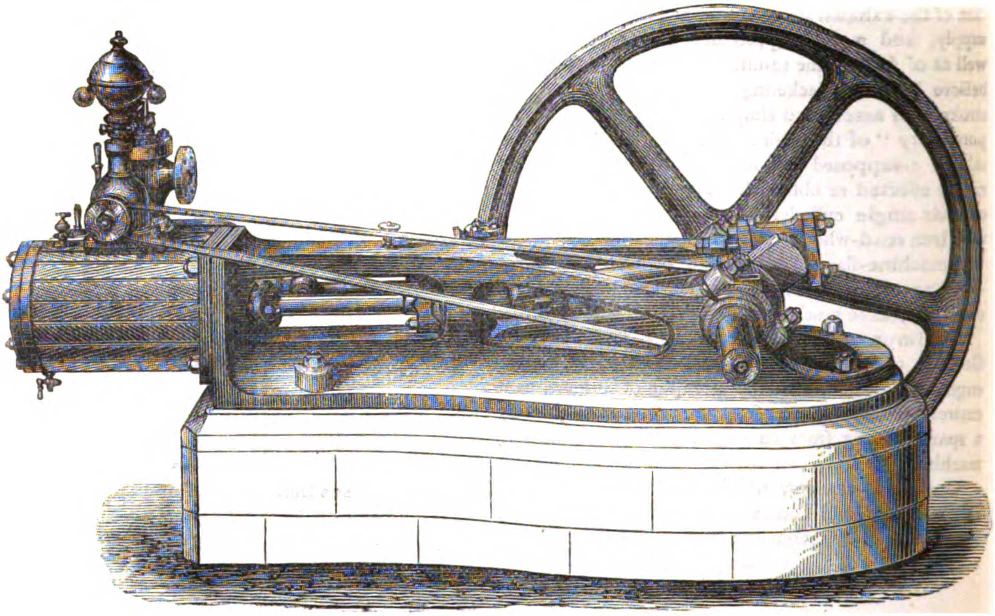


Fig. 37.—Messrs Alexander Shanks & Son's "Caledonian" Horizontal Engine.

MESSRS BROWN & MAY'S STEAM ENGINES.

Messrs Brown & May, of North Wilts Foundry, Devizes, manufacture portable and traction engines of a first-class character. The raw material is carefully selected, and the workmanship is in keeping with the excellence of the iron, wood, and steel used in the manufacture. Their small portable engines are a treat to look at, on account of their high finish, their strength and simplicity. They are economical in the

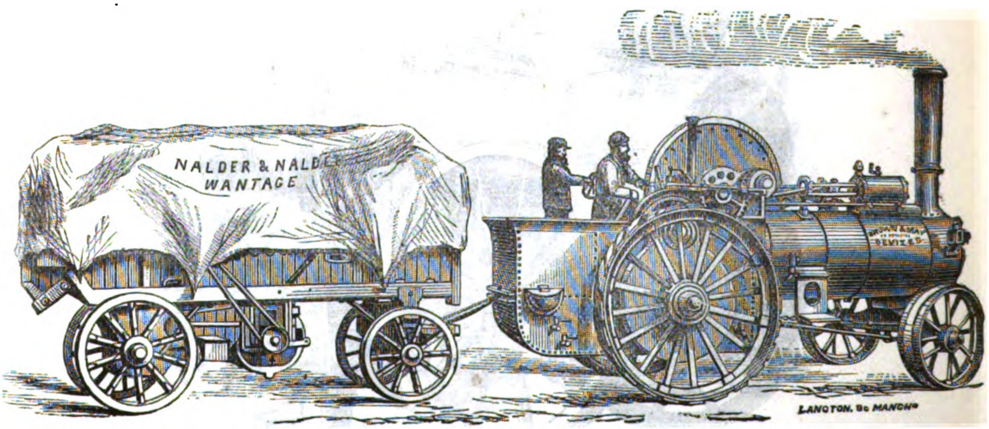


Fig. 38.—Messrs Brown & May's Traction Engine on the road, with Thrashing Machine attached.

consumption of fuel, and easy of draught, and suitable for merchants, shippers, and others requiring 3½-horse power. The larger sizes are fitted with patent water-heaters, the boilers made of the best Staffordshire iron, and the fire-boxes of Lowmoor plates; the tubes are long and not liable to leakage, owing to an improved process of fixing; and it is important to note that both diameter of the cylinder and fire-box is large, which tends to the saving of fuel; and that every boiler before it passes from the works is subjected to a cold-water proof-test of double the working pressure. Another important feature in Messrs Brown & May's engines is the steam blast tube-cleaner. By its use the dirty and disagreeable plan of sweeping the tubes in the old way, by means of a brush, is no longer necessary. Even when the engine is running, the process can be repeated at pleasure; and as a clean tube is always more effective than a foul one, a great saving of fuel is thereby effected; and as less fuel is burnt, the fire-box and tubes become more durable. When properly adjusted, the same apparatus becomes a powerful blower for accelerating the raising of steam. The traction engines are also fitted with a spring foot-plate for the driver, which saves him, if we may so express it, a great amount of wear and tear when travelling over rough and hilly roads. The driving wheels of these engines are of a great width, they have a compensating motion for turning curves, and a double-speed motion of the travelling gear, fast and slow, either of which can be put in or out of gear *instanter*. The traction engines are very moderate in price. We give an illustration of one of Messrs Brown & May's traction engines on the road, with a thrashing machine attached. (Fig. 38.)

MR EDWARD HUMPHRIES' STEAM ENGINES.

The name of Mr Edward Humphries, Atlas Iron-works, Pershore, Worcestershire, is well known throughout the agricultural world for the excellence of his manufacture of steam engines, thrashing machines, &c. No machine passes out of the Atlas Works but what is made of the best material, and exhibits the most careful and cleverest of workmanship. The portable engines manufactured by Mr Humphries are very strong, easy of management, compact, and economical. They are fitted with tension bars, which take all strain off the engine from the boiler. They are fitted with an improved water-heater, consisting of a cast-iron chamber fixed alongside the boiler, through which the exhaust steam passes; the water travels from the pump to smoke-box and back before entering the boiler, thus answering the double purpose of

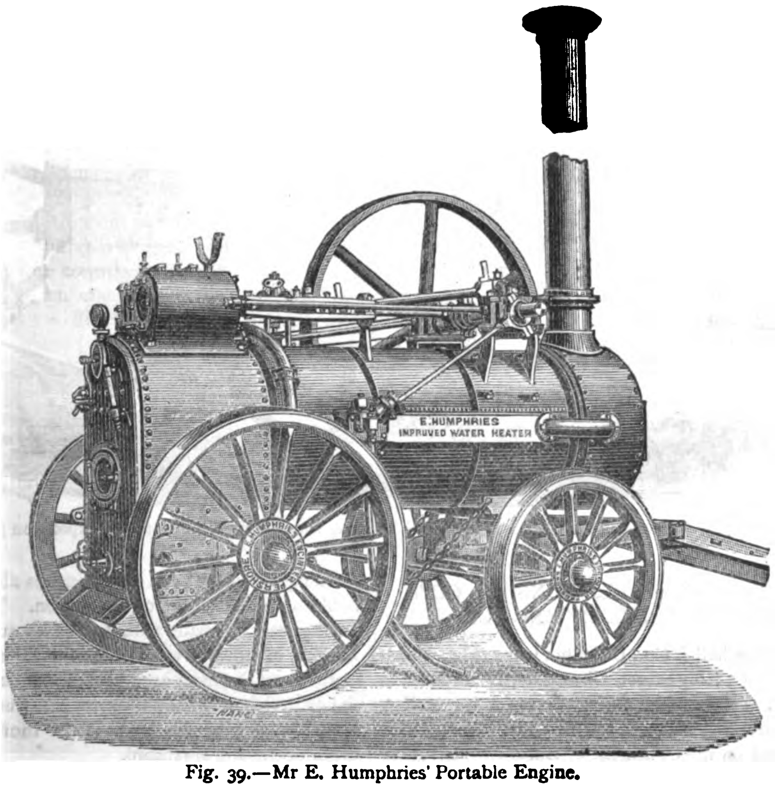


Fig. 39.—Mr E. Humphries' Portable Engine.

thoroughly heating the feed-water, and condensing a part of the exhaust steam, from which the water is again pumped into the boiler, saving both water and fuel the water is raised to nearly boiling heat; the heated water, thus returned to the boiler, would otherwise be wasted; therefore the economy is considerable, in repairs as well as fuel, the ejection of cold water into a boiler being detrimental to its durability. (Fig. 39.)

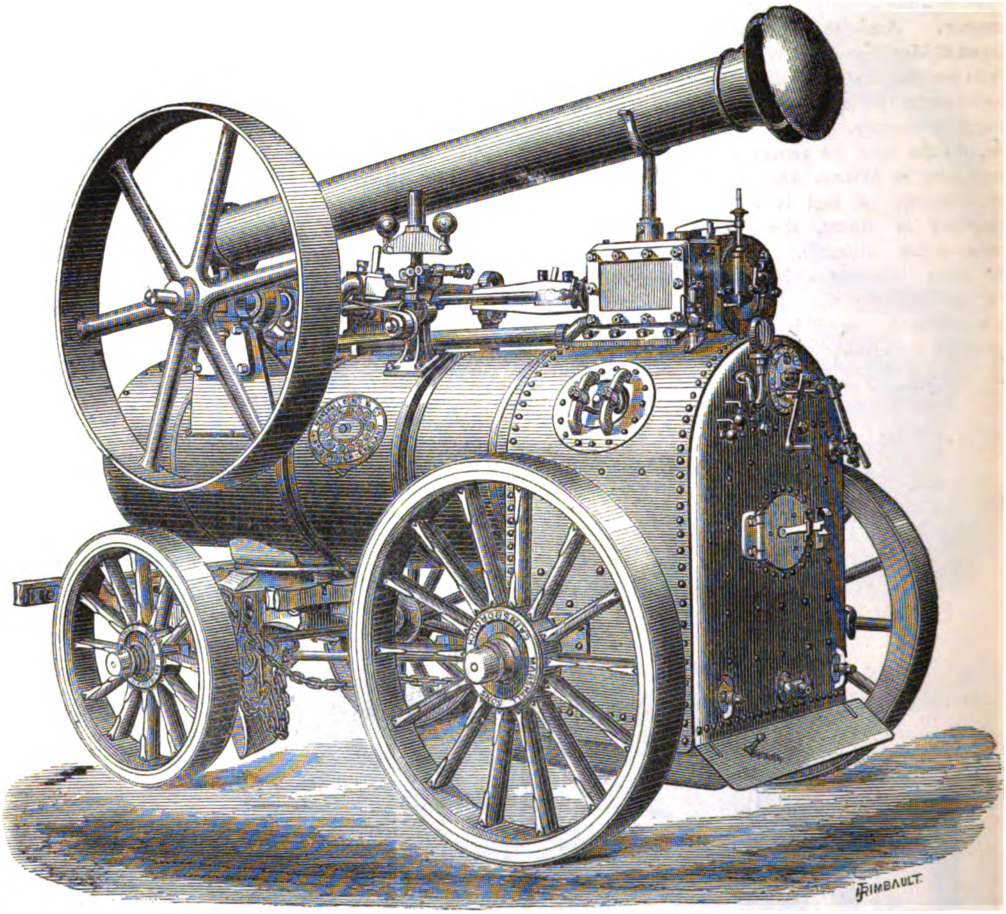


Fig. 40.—Messrs Marshall's Portable Steam Engine, with Hartnell's automatic expansion gear.

MESSRS MARSHALL, SONS, & CO.'S (LIMITED) STEAM ENGINE.

Messrs Marshall & Co., Britannia Ironworks, Gainsborough, and 3 King Street, Cheapside, London, have long been distinguished for the power, the quality, and the durability of their engines, not alone in this country, but on the Continent of Europe. They have had the honour of two gold medals at the Paris Universal Exhibition, 1878, first prizes at the Royal Agricultural Society of England, and at most of the principal shows abroad, and in the provinces where they have exhibited. The chief features in these engines are that the cylinders are steam jacketed, and an efficient feed-water heater is attached to the exhaust. They are made of a special mixture of the best iron, insuring durability in wearing surfaces. The boiler has a large area of heating surface. The crank shaft is arranged to throw off the power "on either or both sides of the engine at once." The accessibility to all parts of the engine is easy; the wrought-iron wheels are adapted for hot and cold climates alike, not being liable to contraction or expansion. The portable engines can be made with fire-boxes suitable for the burning of straw or wood. All the engines are manufactured on the most approved mechanical principles; the material of which they are constructed is of the best, and nothing can surpass the thoroughness and finish of the workmanship.

With Messrs Marshall, Sons, & Co.'s engines, a Giffard's injector can be substituted instead of a force pump, and there is an economy of fuel in all. Their automatic expansion gear consists of a governor, powerful though sensitive, and of novel construction, acting through a link and die on to an expansion cut-off valve working at the back of the main slide valve; the ordinary throttle valve is dispensed with, and the speed of the engine thoroughly controlled by means of the expansion valve which regulates the admission of the steam into the cylinder exactly in proportion to the duty performed by the engine. The gear is simple and reliable in its action, automatically regulating the speed with every varying load, and is thoroughly adapted either for light or heavy work. Messrs Marshall, Sons, & Co.'s 6-horse traction engines are well adapted for driving thrashing machinery. Their vertical engines are got up in the best fashion, both as to workmanship and excellence of material. So, also, are the stationary engines, to which the firm is now devoting special attention. We give an illustration of Marshall's improved portable steam engine, fitted with Hartnell's patent automatic expansion gear.

MESSRS JEFFERY & BLACKSTONE'S VERTICAL ENGINES.

The vertical steam engines manufactured by Messrs Jeffery & Blackstone, Rutland Ironworks, Stamford, possess numerous advantageous features. In the first place this firm make sure that, before they lay anything out upon skilled labour, they have the best iron with which to work. Of Farnley and Staffordshire iron these engines are constructed, and none are sent out until they have been tested to a pressure of 150 lb. to the square inch. They are very compact, the boiler being moderate in size, a capital steam generator, economical in fuel, and not liable to prime, the circulation of the water being perfect. These multi-tubular boilers can be cleaned without more ado than removing the man-hole and mud-hole covers. They will work up the engines to double the nominal horse-power with safety, with the addition of a small extra supply of fuel. These engines are, what is an important consideration for farmers in these depressed times, cheap, easy of repair, and durable. We give an illustration (fig. 41) of these neat vertical engines.

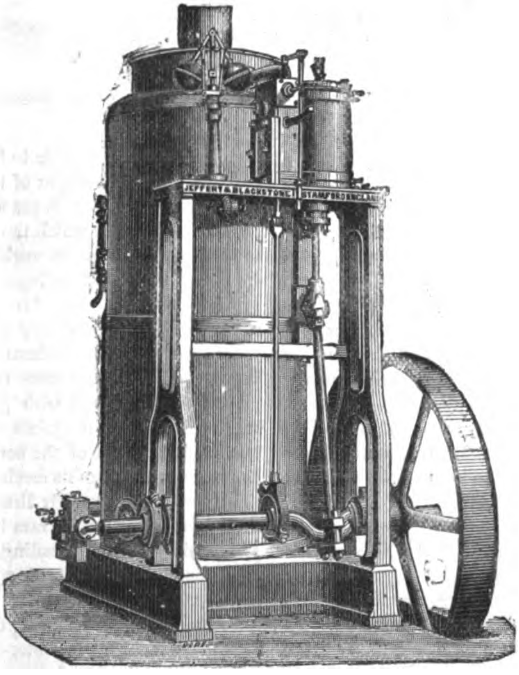


Fig. 41.—Messrs Jeffery & Blackstone's Vertical Engine.

MESSRS RUSTON, PROCTOR, & CO.'S STEAM ENGINES.

There can be no one who may have been present at the principal agricultural shows where Messrs Ruston, Proctor, & Co., Sheaf Ironworks, Lincoln, exhibit, but must have been struck by the beautiful finish of their engines; and the experience of many years has proved that such finish was not veneering, but the result of thorough good workmanship. Gold medals innumerable, silver medals, and diplomas have been gained by these engines both in this country and on the Continent. They have been lauded at St Petersburg as well as at Santiago, at Chorley as at Cologne, at London as at Lyons, and at Lille—that town where Thackeray waited so anxiously for his grandmother's ten-pound note—and at Belfast as at Bolton, and at—well, apt alliteration fails, so we shall safely say everywhere. They are commendable for the ease with which they are wrought by ordinary hands—that is, hands not brought up to the business. The latest improvement that Messrs Ruston & Proctor have made is an attachment to all their engines of Chapman's variable expansion eccentric, by the use of which the exact power may be given off, and not a tittle more. A water-heater of a simple character saves fuel. We illustrate one of Messrs Ruston, Proctor, & Co.'s portable steam engines with single cylinder (steam jacketed), fitted with variable expansion eccentric (fig. 42). This style of engine is manufactured in sizes ranging from 2½- to 12-horse power. Double cylinder engines are made in sizes from 8- to 30-horse power.

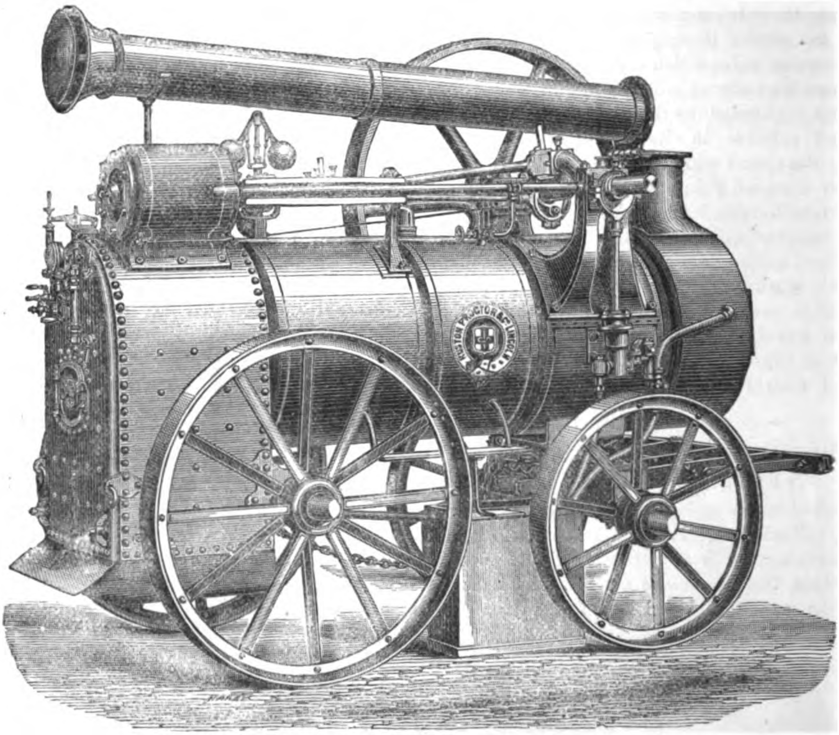


Fig. 42.—Messrs Ruston, Proctor, & Co.'s Single Cylinder Engine.

MR C. L. HETT'S IMPROVED HYDRAULIC RAM.

The hydraulic rams manufactured by Mr Charles L. Hett, of the Ancholme Foundry, Brigg, adapted for supplying country houses, farm steadings, cattle troughs, and gardens with water, are of two types; the lighter, or Anglo-American type, are the cheapest English rams ever offered to the public. They are, however, only adapted for a fall of 8 feet and under, and lifts not exceeding 100 feet. The improved or high lift ram is characterized by its solidity and quality. It is powerful, being able to force water from twenty to thirty times the height of the fall from whence the water is derived, and is practically unaffected by the horizontal distance which the water has to be driven. It is very inexpensive in working, as may be gathered from the fact that, independent of the latest improvements adopted by Mr Hett, some of his rams have wrought satisfactorily for a period of a dozen years and upwards without requiring any repairs, beyond a few trifling ones to the valves. The improved ram is fitted with gun-metal delivery-valve and seat, and all the joints are faced. As affording one single instance of the action of Hett's improved hydraulic ram, and of its mechanical efficiency, we may simply notice that on Mr Brook's Acre House Farm, near Caistor, where the ram is placed at a distance of 570 yards from the steading, and 203 feet below its elevation, with a fall of 23½ from a 2-inch iron pipe, it delivers the water very satisfactorily, the ascertained efficiency being 64 per cent. Mr Hett appears to have made water-raising a speciality, and has recently introduced a new form of pumping water wheel, and a very practically arranged centrifugal pump, with a removable, which gives access to the interior without dismembering the pumps.

MR E. S. HINDLEY'S VERTICAL ENGINES.

Mr Hindley, Bourton, Dorset, makes vertical engines of a very superior description. They are strong, compact, easy of management, and can do all the necessary driving of stock-feeding machines on the farm, such as chaff-cutters, root-pulpers, corn-grinders, &c. One of Mr Hindley's 2-horse engines costs no more than one good horse nowadays, and when it is not in work it requires no food. It can be readily made portable, as can be seen from the illustration (fig. 43). In its working it has proved thoroughly efficient, not only in the United Kingdom, but on the Continent and in the Colonies. At Paris Mr Hindley got an honourable mention. The award might have been higher.

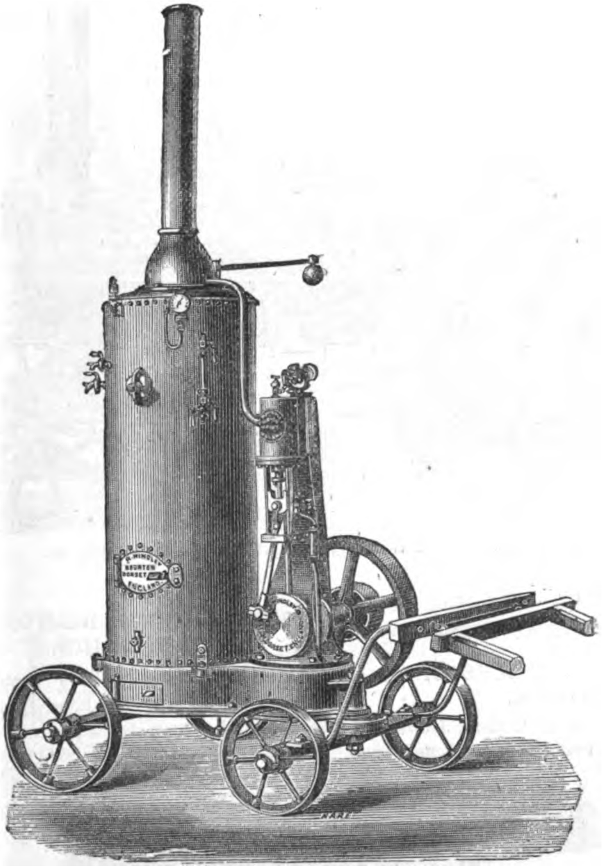


Fig. 43.—Mr E. S. Hindley's Vertical Engine.

MR FREDERICK SAVAGE'S AGRICULTURAL WINDING ENGINE.

Very appropriately has Mr Savage, St Nicholas Ironworks, King's Lynn, named the engine of which we give an engraving (fig. 44) the "Agriculturist." In all essentials—in careful calculation of how to secure the greatest amount of power with the greatest economy of fuel, the greatest strength without weight or clumsiness, and easiness of friction—consequently little wear and tear—Mr Savage has produced an excellent engine in the one which we notice. It is a good locomotive, and can be adapted to ploughing and thrashing. It is not dear. In ploughing there is little necessity for fixing. The engine can, by the arrangement of gearing, be made to go at the speed of 4 miles an hour, and, of course, as slow as you like.

MESSRS PICKSLEY, SIMS, & CO.'S HORSE GEARS.

Messrs Picksley, Sims, & Co. have brought out a new horse and pony gear with a view to meet the requirements of many agriculturists. These machines are so constructed as to drive churns, chaff-cutters, mills, &c., either directly from the gear by means of the second motion being upon the same frame; or, where a high speed is necessary, an intermediate motion can be used with the gears. This implement is made of the best material, is well finished, and easy of propulsion, and the gearing is protected from dirt.

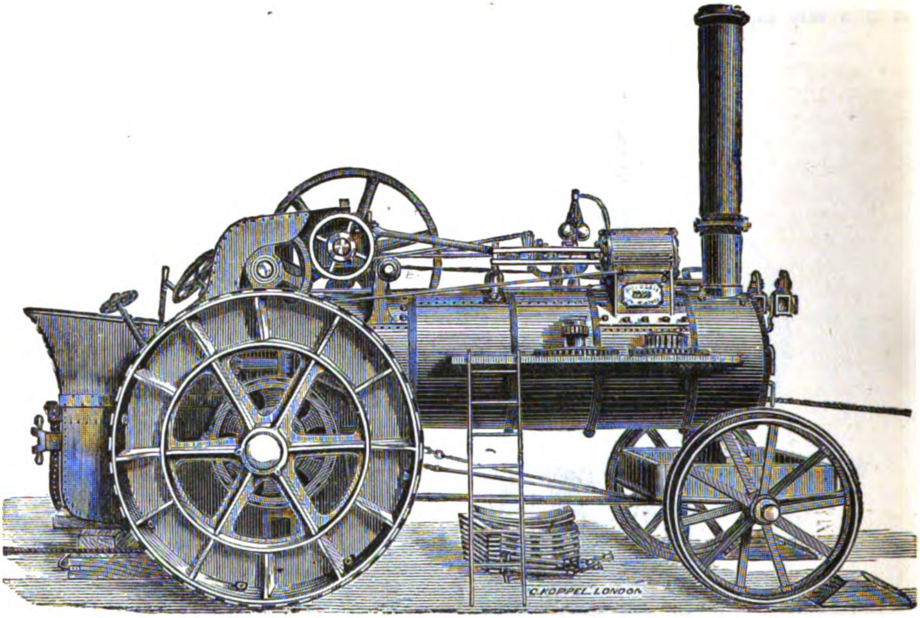

C. KOPPEL. LONDON.

Fig. 44.—Mr F. Savage's Winding, Ploughing, and Traction Engine.

MESSRS JEFFERY & BLACKSTONE'S HORSE GEAR.

Messrs Jeffery & Blackstone, Rutland Ironworks, Stamford, send out an excellently well-made and compact horse gear, which is easy of propulsion; frames, pillars, and intermediate head are constructed of wrought iron; the upright shaft and pole flange are connected by a self-acting clutch, which relieves any sudden strain upon the machinery, and prevents danger to the horse. The pole is so stayed as to prevent all springing and jar upon the horse (fig. 45).

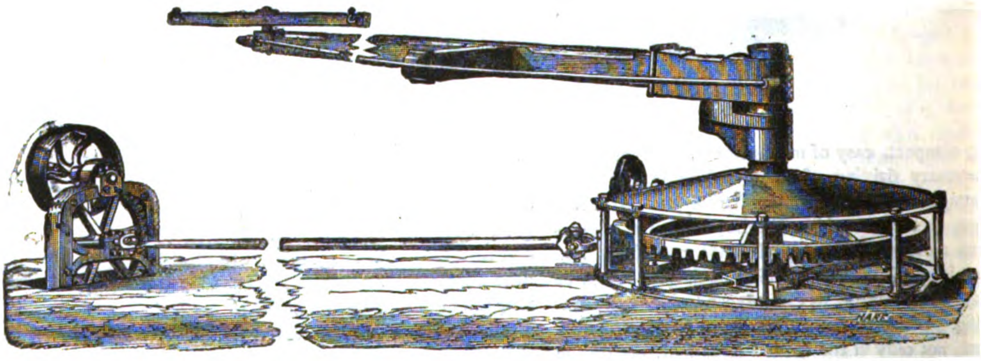


Fig. 45.—Messrs Jeffery & Blackstone's Horse Gear.

MESSRS HENRY BAMFORD & SONS' IMPROVED HORSE GEAR.

Numerous accidents have happened to horses through the pole of the horse gear running on to them after they have stopped or slackened their pace; kicking and plunging each time generally ensues, and valuable animals have been permanently injured or rendered vicious by this means. Messrs Henry Bamford & Sons, Uttoxeter, Staffordshire, have brought out a new machine, in which is fixed a self-acting spring ratchet on the intermediate motion, thus allowing the fly-wheel of a chaff-cutter or other machine to continue running without moving the pole after the horse has stopped or slackened his pace. The risk and danger attending the use of the old horse gears is thus obviated. The main driving-wheels are made without any openings or spokes, so that it is impossible for an animal to get its feet entangled in the gearing. This horse gear gained the silver medal of the Staffordshire Agricultural Society against strong competition in 1877.

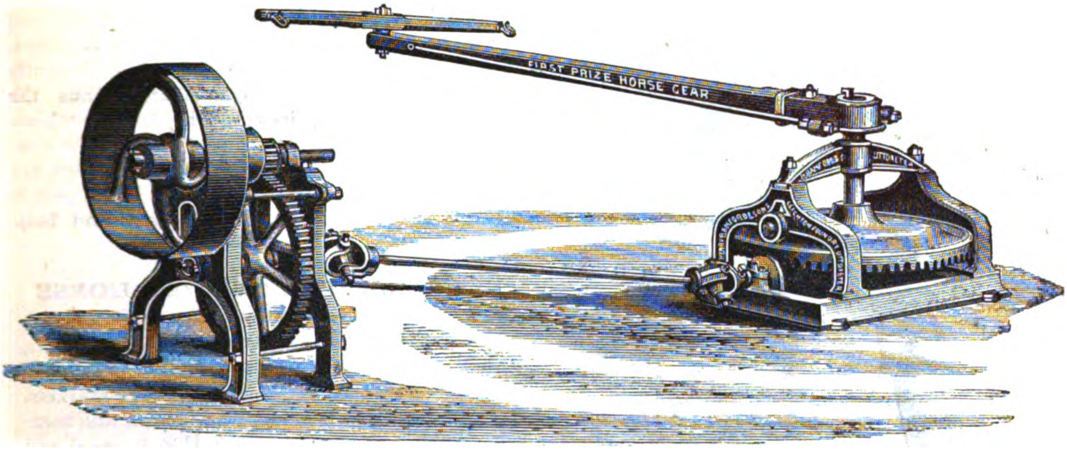


Fig. 46.—Messrs H. Bamford & Sons' Improved Horse Gear.

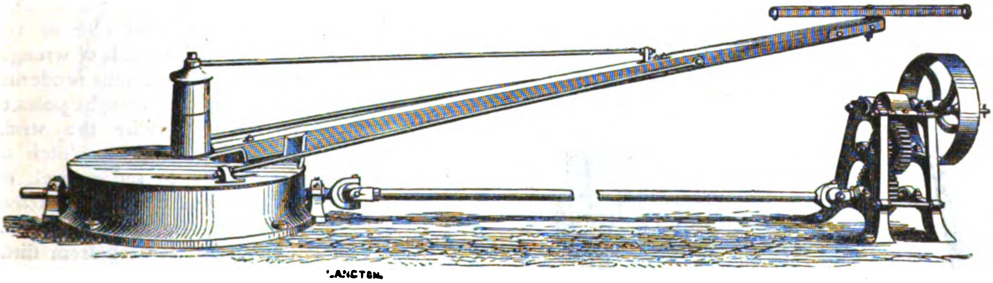


Fig. 47.—Messrs Richmond & Chandler's Horse Gear No. 0.

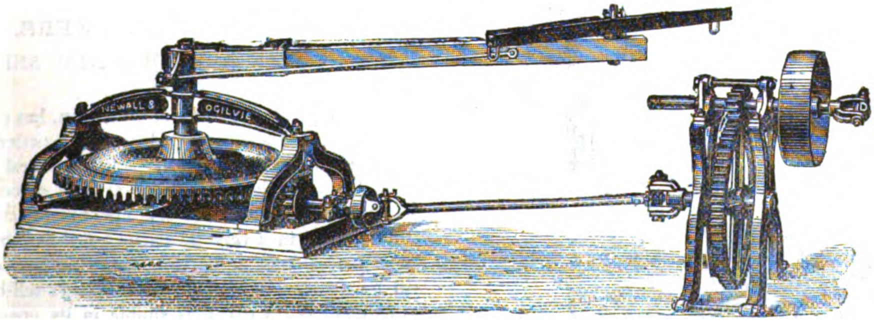


Fig. 48.—Messrs Newall & Ogilvie's One-Horse Gear.

MESSRS RICHMOND & CHANDLER'S HORSE GEAR.

Where steam and water are not available, horse gear as a motive power is an imperative necessity on small holdings. We recommend Messrs Richmond & Chandler's (Salford, Manchester) horse gear. It is light in working for the horses, and kept clean from dust and danger by being capped. We illustrate this one-horse gear, which is arranged so as to keep horses from hurting themselves, as the poles stop as soon as the horses cease to pull. The driving gear is cast on a flat top, which revolves. An upright pillar, round which the top works, is cast on the bottom frame, and is turned at both ends to give the necessary bearings. A hollow pillar, cast with the top, and carefully bored, revolves on the upright pillar. Thus the whole of the apparatus, including the driving-wheel, is composed of only two parts. The first motion consists of a bevel wheel and pinion. The bearings are brass, and the gear has universal joints. The pole is attached to the top by a strong bracket and bolt. (Fig. 47.)

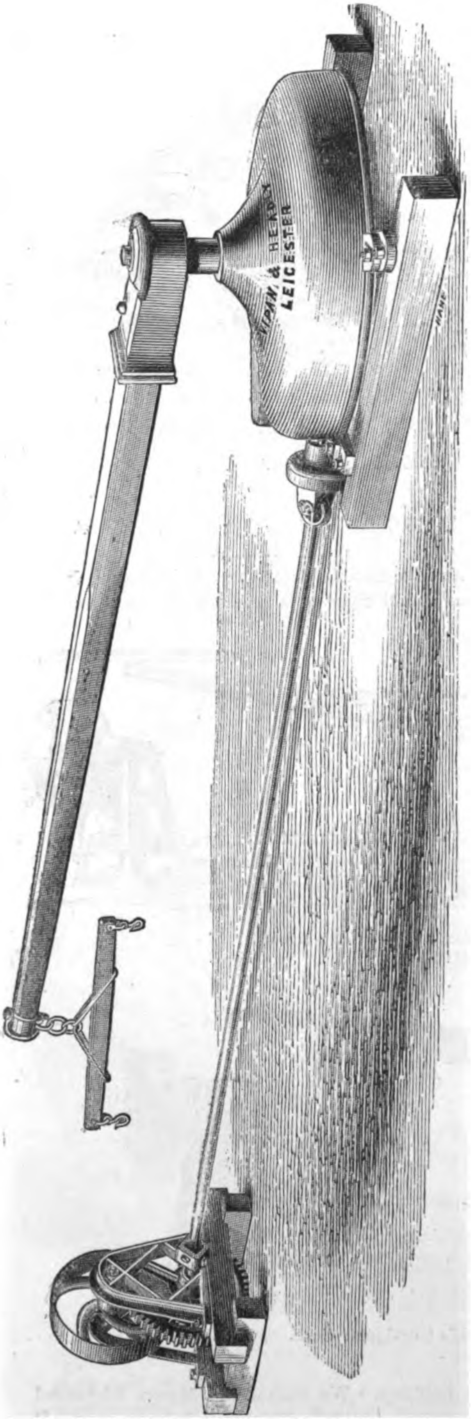


Fig. 49.—Messrs Vipan & Headly's Horse Gear.

MESSRS NEWALL & OGILVIE'S HORSE GEAR.

Messrs Newall & Ogilvie, St Philip's Ironworks, Bristol, are noted for the manufacture of horse and pony gears adapted both for home and foreign markets. Their one-horse gear is strong, simple, neat, and compact. It has a covered driving-wheel to prevent any accidents, and is excellently adapted for driving chaff-cutters and other economizers. The Universal spring clutch on this machine is a decided improvement. (See fig. 48.)

MESSRS VIPAN & HEADLY'S HORSE GEAR.

Messrs Vipan & Headly, Leicester, manufacture excellent horse gear adapted for either one or two horses. The upright shaft, in both cases, is of wrought iron, and all the bearings are of brass, thus rendering them durable. They have improved draught poles of wood, with a tension rod to equalize the strain throughout, and are fitted with spring clutch to prevent breakage of machinery by sudden jerk or stoppage; the workmanship is of the best character, and the intermediate motion very neatly designed. The working parts are covered to keep from dirt. (Fig. 49.)

HARVESTERS.

SELF-BINDING REAPERS.

MR WALTER A. WOOD'S NEW SELF-BINDER.

This, the greatest novelty of the season, has proved itself a decided success, judged by the experience of the past season in America, Australia, and New Zealand, in which countries upwards of 9,000 have been used. This machine can undoubtedly cut and bind all crops in a very satisfactory manner, but no doubt before another harvest comes improvements will be made. Of Mr Walter A. Wood's self-binder we may briefly say that it is simple in its operation, which is reliable under all circumstances. It completely separates the grain from the reaper, and presses perfectly the sheaves, which can be made large or small at the will of the driver. The sheaves are bound with annealed steel wire at a cost of about 1s. 6d. to 2s. per acre. Some have objected to wire as dangerous to thrashing machines and to stock, but to obviate such objections, in which we think there is not much force, Mr Walter A. Wood has invented a special kind of shears for cutting the wire, and at the same time holding and drawing it from the sheaf; so that, except through gross carelessness, the

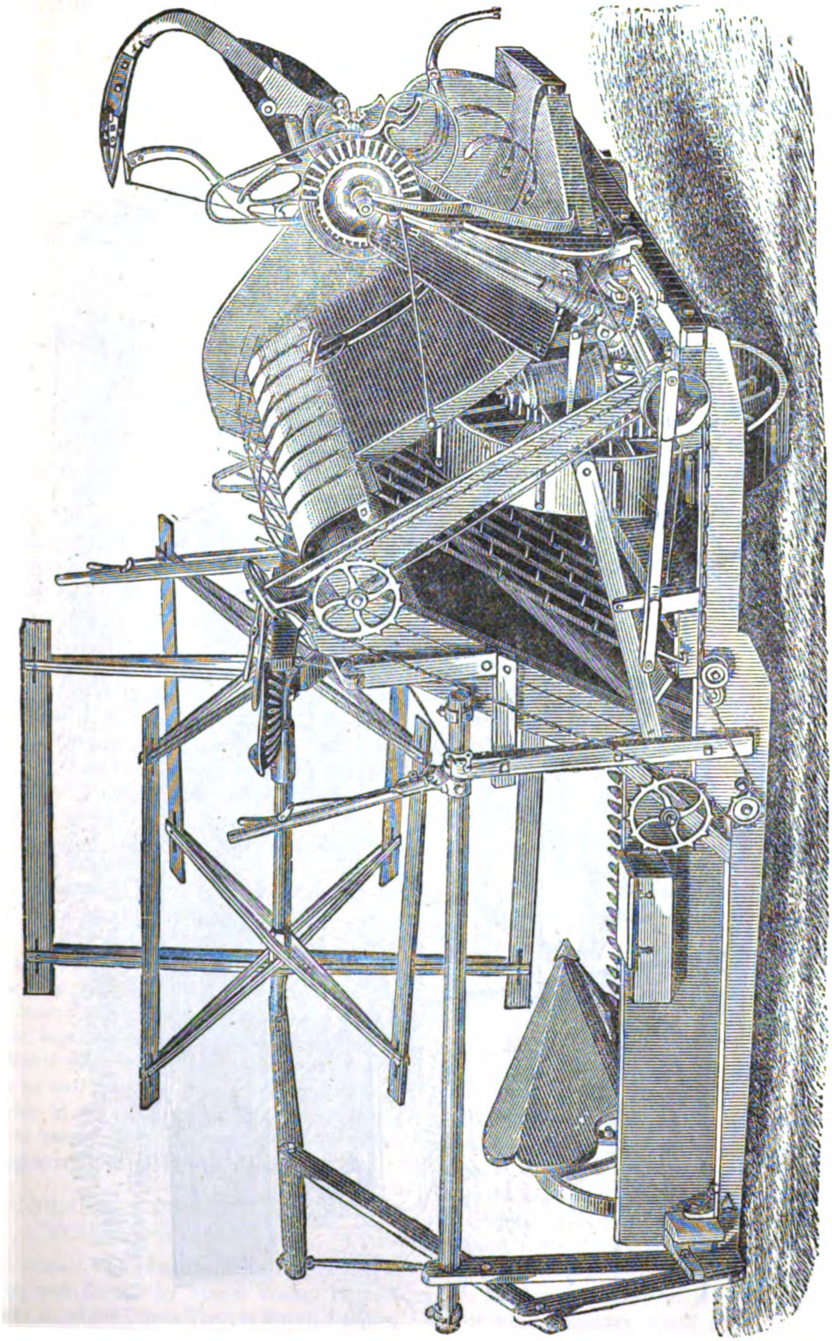


Fig. 50.—Mr Walter A. Wood's Self-Binding Harvester.

wire cannot pass into the thrashing machine, and so into the stomachs of the animals if they would eat it. The binder, it should be added, practically excels in its capacity for large sheaves, and binding them tightly, making the matter of the saving of wire alone a most decided advantage in its favour. A sheaf of grain 12 inches in diameter requires much less wire than two sheaves of 6 inches diameter each. The bands do not become unloosed, and much labour is saved in shocking and stacking. It is altogether a marvellously clever contrivance, which we illustrate (fig. 50), and which gained the highest honours at the Paris Exhibition, and twenty-three first-class awards during the season of 1878.

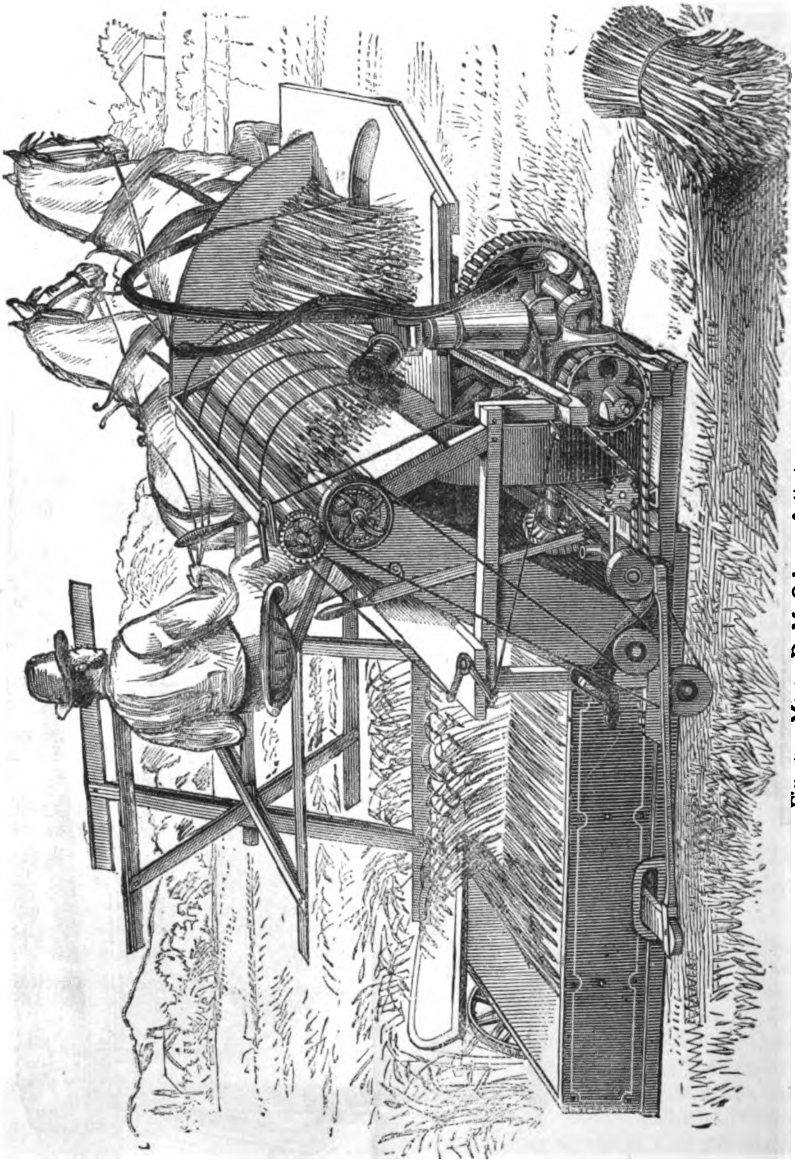


Fig. 51.—Messrs D. M. Osborne & Co.'s Self-Binder.

THE "OSBORNE" SELF-BINDING HARVESTER.

For a period of fifteen years the inventor of this machine has been experimenting, and has at last succeeded in producing a self-binder of a very successful character. For two years it has been satisfactorily tried in the field, and having tested it both in America on a comparatively large scale for a new machine, and in this country, Messrs D. M. Osborne & Co. having made great improvements for the coming season (1879), now feel confidence in recommending it. It is a most ingenious contrivance, and will prove a great saving of labour to the agriculturist. We may briefly describe the working parts and the operation of the binder. The needle-arm is hinged at the rear and stands stationary, for a moment, while sufficient grain is being delivered from the elevator; the end of the wire, with which the needle is threaded, is held under the binder-table by the lower wire-holder; the foot of the driver sets the mechanism in gear, the needle rises up and swings over the accumulated grain, where, descending, it girdles the sheaf with the wire, strongly compressing it; passing further down, the needle carries the wire to a position where it is seized by the upper wire-holder; the needle now begins to sweep towards the outside of the table, and the twister, with its cutters, revolves; by the time all the parts, moving outward together, have reached the edge of the table, the sheaf is completed, and drops upon the stubble. The first end of the wire, having been twisted and cut off, to make this sheaf, the lower wire-holder has seized upon the wire again, just before the cutters have severed it, and now the binder mechanism stands in the same position as at first, ready to again respond to the will of the driver. With no change or adjustment of the mechanism, it will make a bundle of from 1 inch to 2 feet in thickness. Messrs D. M. Osborne & Co. use one wire, from but one spool, and require but one set of twisting and cutting machinery, thus reducing to the lowest point the liability of breaking, wearing, or getting out of order. No. 20 steel wire is used, because, all things considered, it is better, more reliable, and cheaper than anything else. Messrs D. M. Osborne do not believe that wire is injurious, yet, to satisfy a small demand, they will "send with each machine a pair of band-cutters of novel design, with which the bands may be cut at the thrashing machine; they are made to cut, and hold the band by one end, enabling the operator to keep the wire all together, and throw it by the handful into a box or barrel conveniently below him. A system has always had its friends, but our own experience has been, that it is most profitable not to cut the bands at all; the thrashing is just as well done, the bands will pass through the machine in one piece, cattle will not eat them, and no wire has ever yet reached a flour mill." We give an engraving (fig. 51) of this binder.

MR McCORMICK'S REAPING AND SELF-BINDING MACHINE.

Mr McCormick, of Chicago, who is represented in this country and Europe by Messrs Waite, Burnell, Huggins, & Co., of 228 Upper Thames Street, London, is the first who made reaping machinery practical. Ever since the Great Exhibition of 1851, when his reaper attracted so much attention, he has been unwearied in his endeavours to improve labour-savers in the field, and his perseverance has been rewarded to his heart's content. For twenty-seven years he has been competing in the principal corn lands of America, on the Continent, and this country, and everywhere with marked success; but never has such victory been achieved as that which crowned Mr McCormick's labours last year. All Mr McCormick's machines are constructed out of the best material, upon sound mechanical principles, and are marked by careful and skilled workmanship. For two or three years Mr McCormick has almost been out of the region of competitive trials; but last year he came forth like "a giant refreshed," and, with his wire-binding self-sheafer and reaper, literally carried everything before him. Mr McCormick's reaping self-binding machine had the enviable distinction of gaining the Royal Agricultural Society of England's gold medal for the first efficient sheaf-binder that ever was produced; it was allotted the grand prize at the Great International at Paris; and its inventor was promoted to the dignity of Officer of the Legion of Honour; and at various shows in France, in Scotland, and England, the highest honours were bestowed upon the machine, which cuts cleanly, binds the sheaves closely and neatly, and deposits them on the ground with an easy motion out of the track of the returning horses. Mr McCormick's binder consists, first, of the reel, knife, and platform; in the second place, of an elevator; and in the third, of the binding apparatus.

The reel is driven by two endless chains, the lower one direct from the axle of the main supporting wheel. The lower chain pulleys are supported on strong fixed bearings, and also the lower pulley of the upper chain; only the pulley on the end of the reel shaft changes position, and as the bearings of the reel shaft are held in the hands of two crank-arms rising from a rocking shaft, the two arms being wide apart, and the rocking shaft supported in strong fixed bearings, the pulleys and two endless chains work truthfully to each other, in whatever position the reel shaft may be in. The reel is controllable at the pleasure of the driver, who can set it forward or backward, higher or lower, without stopping his team, as he pleases--forward and low to pick up laid corn or reel on short crops to the knife, or vertically over the rock shaft for long crops, and so on.

The knife is driven from behind, and has a long stroke. A large spur wheel on the axle of the main wheel drives a small spur pinion on the counter shaft, which, by means of a bevel wheel on the other end, drives the crank shaft. All the shafting is short, and the bearing supported in strong framing, so that vibration, the great source of tear and wear, with its many other mishaps, is reduced to a minimum.

Mr McCormick's elevator consists of two endless aprons with cross-bars, which raises the grain over the main wheel to the binding apparatus—an arrangement which may yet be perfected. Meanwhile, it may be mentioned that the upper apron co-operates with the lower one in raising the grain, and it protects it the wind. In the binding apparatus there are two spools. The wire from the one at the right hand of the driver passes over two pulleys, one on a take-up arm, the other on a guide-arm, down over a pulley on the binder-head to meet the end of the wire from the other spool beneath the binder platform on the opposite side. Spiral springs and levers impart a suitable amount of take-up and give-out action, and

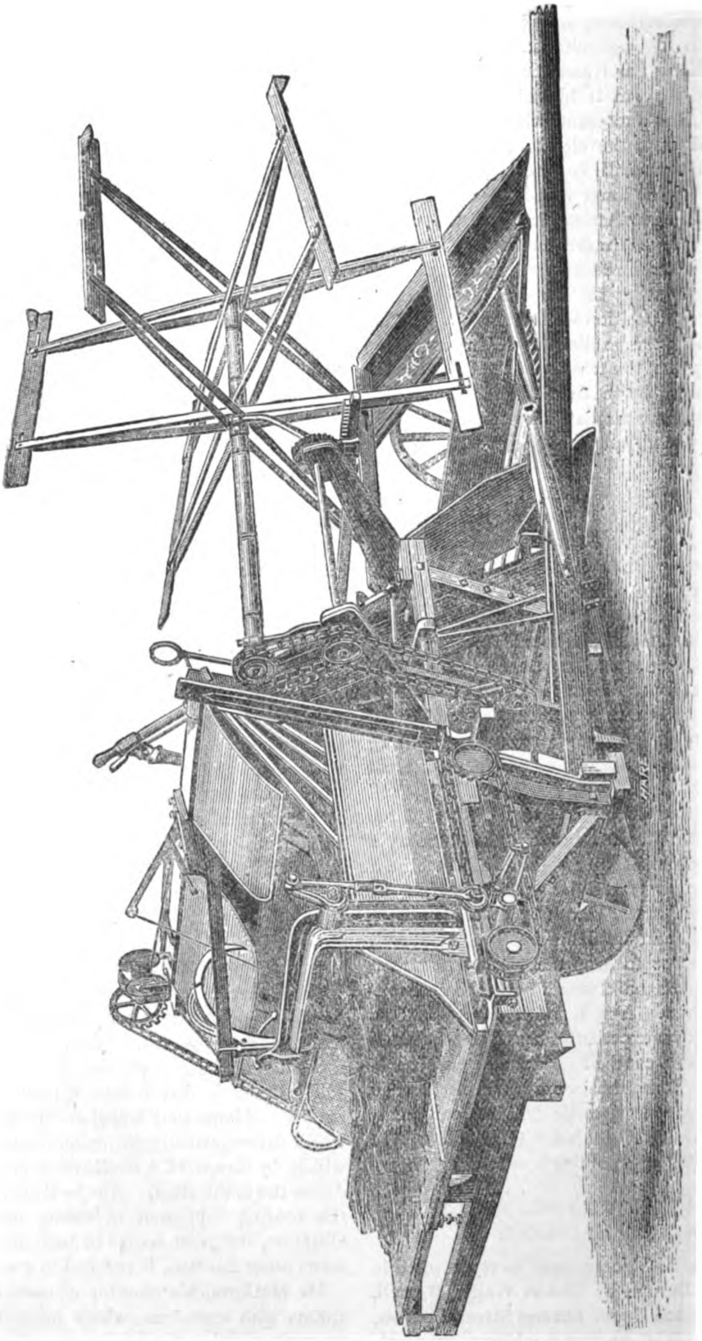


Fig. 52.—Mr McCormick's Self Binder (Side View).

prevent slack. Brakes on the spools secure the wire from passing without actuation by the binder.

The twisting mechanism is immediately under the compressing arms below the platform, and consists of a plate with a notch for guiding the wire to the twisting pinions below it, which are driven intermittently by a system of gearing from the backward and forward travel of the bent standard that carries the binder head. A half turn places the two wires on opposite sides of the twister pinion, which is made fast when stationary, but when a cam comes round it it unlocks the twister pinion, which makes a double twist, one above and another below. This done, an upper pinion, driven differentially, or faster than the lower one, cuts both wires—thus setting free the sheaf and uniting the two wires from the two spools by a twist, as formerly stated.

The bent arm that carries the binder head and compressor arms, rises from its traversing carriage or frame outside the butt end of the sheaf, so that in discharging the sheaf the ears of long corn are not thrashed by coming against it, as in other machines. The to-and-fro travel of this bent arm is effected by reciprocating endless chain-gear. This chain gear also drives by means of connecting rod and crank the shaft from the elbow of the bent standard, the sector gear that actuates the binder or wire-carrying head and compressing arms. The latter have each a two-fold function to perform. Thus the lower loop arm first compresses, and then by means of the bent loop clears the way for the newly-bound sheaf. The upper one has a shorter radius than the wire-carrying arm, so that in compressing the sheaf it guides the wire ready to cross the other wire from the lower spool above the twister, whilst the other does it below the twister. Thus the mechanism and operation are both remarkably simple and effective, and not liable to get out of order, and, as each sheaf is bound, it moves its predecessor easily off the platform on to the ground, without kick or drag to thrash ripe grain. The advantages of the traverse of the bent standard are threefold—first, a cleaner separation is effected between the corn surrounded by the wire and that falling flown to the gravelling concave; second, less power is required to work it than by those machines which squeeze the grain in binding it along an equal distance; third, the discharge of the sheaf is much better. The binder can be adjusted for long or short straw, and altogether Mr McCormick may congratulate himself on having produced the greatest and most successful novelty of the year in connexion with reaping machinery.

REAPING AND MOWING MACHINES.

MR WALTER A. WOOD'S REAPERS AND MOWERS.

It is no flattery to say that Walter A. Wood's (36 Worship Street, London) reapers and mowers have made, within the last quarter of a century, a more extensive and favourable impression upon agriculturists throughout the world than those of any other maker. Starting at Hossack Falls in 1853 with the manufacture of 500 mowing and reaping machines, Mr Walter A. Wood manufactured upwards of 25,000 during the past year, and the grand total of his manufactures has reached the enormous number of 302,092. As shewing the growing appreciation in which these machines are held, it is worthy of mention that no fewer than 132,616 have been manufactured and sold since 1873, the date at which the new iron-frame mower and celebrated self-delivery reaper was introduced into this country. All the machines of Mr Walter A. Wood are manufactured out of the best material, and are characterized by general excellence of workmanship. Their leading features may be briefly indicated as simplicity in construction, lightness of draught, ease of management, and as having as few bolts as possible. All the journals are emery-ground and perfect; the bearings are of the best gun metal, made in one piece, and fitted into a taper hole in the iron frame, so that, if worn, they can be easily removed and replaced by new ones. They are fitted with a new patent oiler, which effects great saving in wear and tear. The open mallable steel-faced slipper guard prevents choking or wearing, and secures a low cut. The balance of the machine is perfect. The entire frame is supported and tilted upon the main axle, the tongue being pivoted, at its rear end, to the main axle by a connexion which supports the driver on a spring seat. The seat is so placed that the driver's weight balances entirely the weight of the pole, so that there is no pressure upon the horses' necks. The driver sits in rear of the cutters, where he can watch and perfectly control their operation, and at the same time be secure, in case of any accident, from being thrown before the cutters, which so often happens with rear-cutting machines. They are adapted for working on uneven ground; and, finally, they have a trim and neat appearance. We illustrate Mr Walter A. Wood's iron-frame mower (fig. 53), of which about 50,000 are now in use, and favourably regarded in all parts of the world, and for which 169 first prizes were awarded between 1873 and 1877 in Europe alone.

The new one-horse mower is a gem of a mowing machine, cutting 3 feet 3 inches in width with the greatest ease. It is, indeed, quite a novelty. All gearing has been removed from the wheels, reduced to the smallest possible compass, and covered to protect from dust and dirt. The frame is of iron, there are but few bearings, and the machine has a neat, light, and stylish appearance, which will at once commend it to favour, while for strength and durability it will fully equal its famous predecessor. From tests made, it is believed that the draught will be at least 25 per cent. less than the 1873 mower—an important item for those working with small horses. We give a cut of this machine (fig. 54).

Mr Walter A. Wood likewise manufactures a machine on the same principle for two horses, which cuts 4 feet 3 inches in width.

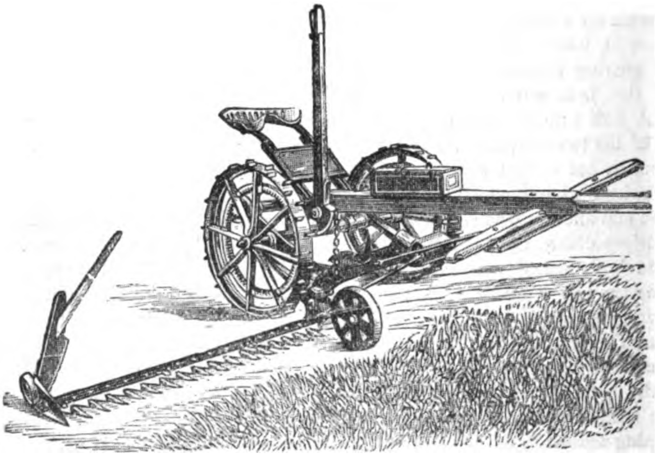


Fig. 53.—Mr Walter A. Wood's Iron-Frame Mower.

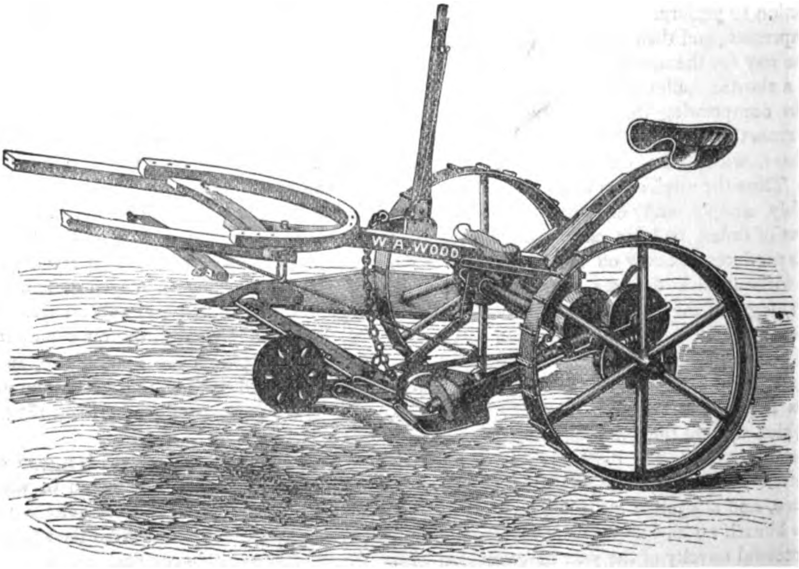


Fig. 54.—Mr Walter A. Wood's One-Horse Mower.

Their new reaper, with controllable rakes, is remarkable for its strength, lightness, and easiness of draught. While cutting a breadth of 5 feet, two horses can easily manage it. It is made with both four and five controllable rakes, which are perfectly under the control of the driver, who can make the sheaves any size desired. The rakes can be set as in the ordinary fixed rake machines, while at the same time each rake can be controlled as desired. This is an important feature, especially when turning corners, or for carrying straw when not cutting. In other respects the new reaper remains unchanged from that of 1877, which gained such golden opinions from the many agriculturists who used it. The platform can be speedily folded up to enable the machine to pass through any ordinary gateway.

THE JOHNSTON HARVESTER CO.'S WROUGHT-IRON HARVESTER.

The Johnston Harvester Co. (Mr Huntley, Manager), 1 and 2 Chiswell Street, London, have great reason to congratulate themselves upon the success (well deserved) which attended their visit to "the World's Great Fair" at Paris last year. At the great field trial held at Mormant, under the auspices of the Directors of the Paris Universal Exposition, where no fewer than thirty-five machines, manufactured by the principal reaping machine engineers in the world, competed, the Johnston Co., with their wrought-iron harvester, carried off the first and only prize for reapers; and it was also with reapers they gained the distinguished honour of two gold medal awards. In July, at the International trials at Middleburg, Holland, extending over three days, they obtained three first prizes; and to sum up the triumphs of these harvesters, we may state that since the harvest of 1877 up to the end of harvest 1878, they had won, in well-contested fields, no fewer

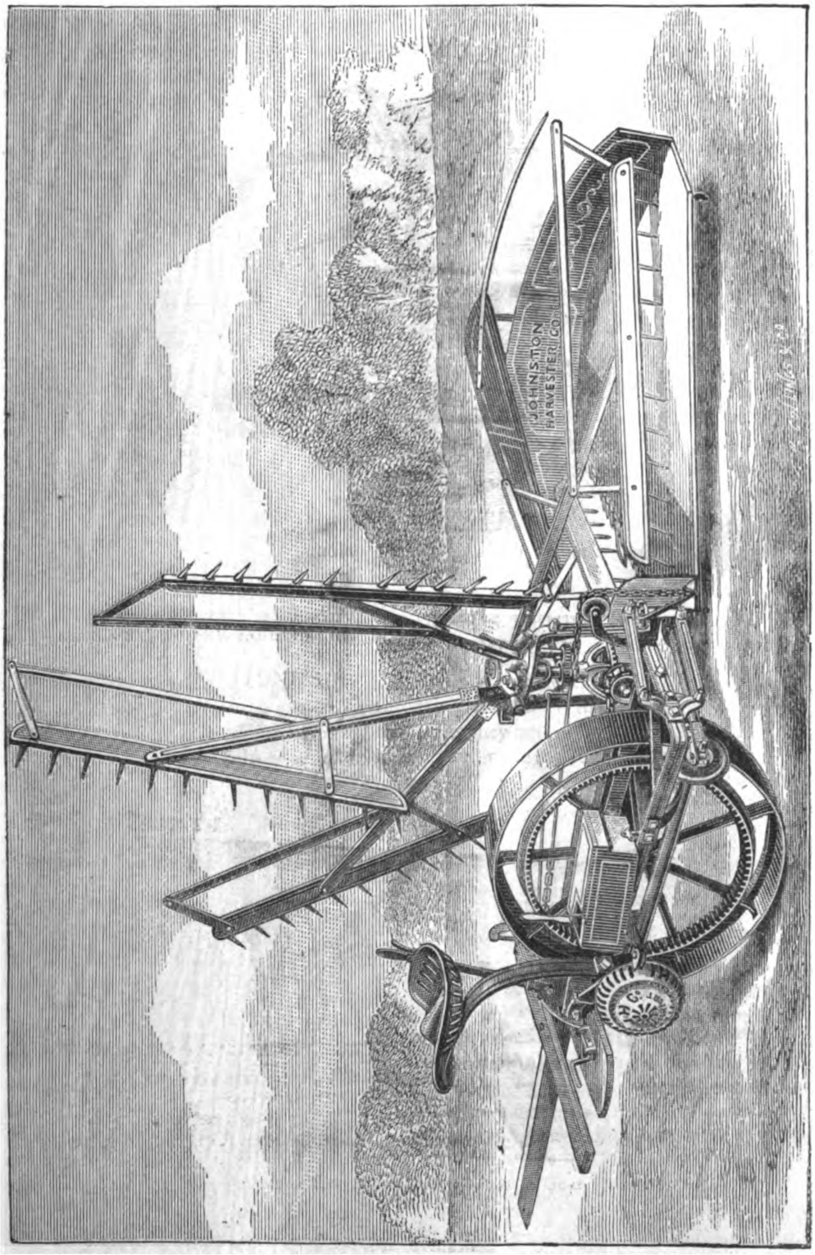


Fig. 55.—The Johnston Harvester Co.'s World's Prize Reaper.

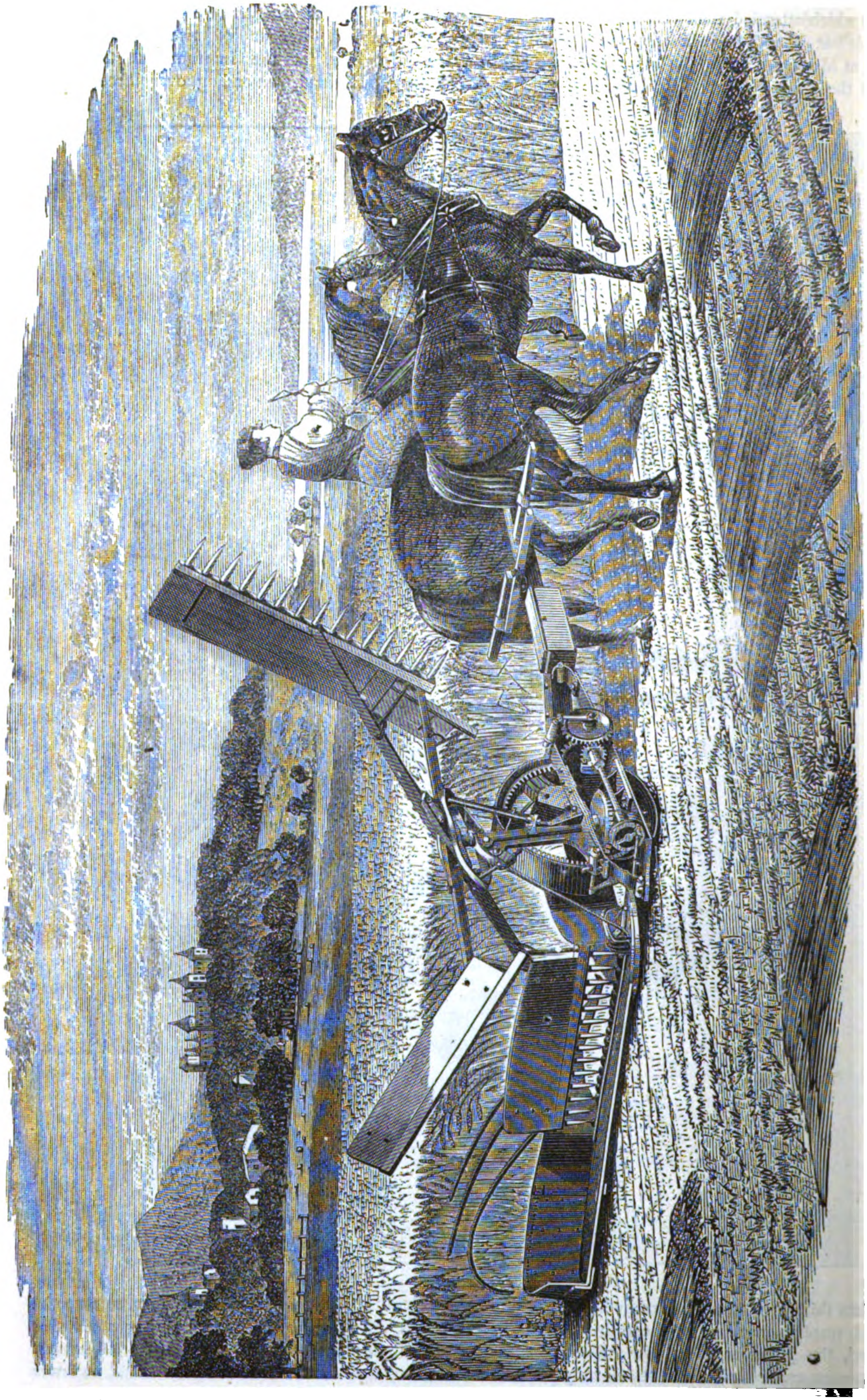


Fig. 56.—Messrs. Samuelson & Co.'s Original Self-Raking Reaper.

than seventy-six first prizes, consisting of fifty-two gold medals, seventeen silver medals, and 4165 fr. in money, equivalent to about £170. Why, it may be asked, have these American machines risen so rapidly in favour? The answer is easily given. It is this, that while they are stout and strong, they are light and easy of draught, the gearing is simple, the knives are of excellent material, and cleanly cutters of any kind of crop, and the self-raker as perfect as a sheafer could be. We give an illustration of the Paris prize machine (fig. 55), which has been significantly denominated "The World's Prize Reaper."

MESSRS SAMUELSON & CO.'S REAPERS.

To the Messrs Samuelson & Co., Britannia Ironworks, Banbury, belongs the credit of having been the pioneer of reliable self-raking reapers. Other, rather we should say only one opponent was in the field, Mr M'Cormick, and his machine at that time was not so perfect as that sent out by the Banbury firm. All Messrs Samuelson's machines, it ought to be stated, are made of the best material, thus securing lightness with strength. They are light of draught, and simple in construction. Their "Omnium" is an extremely light self-raker. The drivers its comfortably on the body of the machine, where he can see everything connected with his work, and put the gear in or out easily. The weight on the off-side is balanced, and the equilibrium of the machine on its wheels is so perfect that it goes backwards or forwards, or turns with equal ease. Owing to the perfect balance of this machine, all need of a shaft for one of the horses is avoided. The off-side is fitted with a simple arrangement of swivel wheel which further facilitates turning on soft land, and prevents the cutting up of the surface at the corners, and the consequent injury to the seeds—a fault so frequently and justly complained of in some other reapers. The finger beam is so placed that the cut is in a line with the main axle, and therefore more perfect over undulating surfaces. It is so compact that it can pass through ordinary gateways without the removal of a single rake, all that is required being the unshipment of the driver's seat. By a lever the fingers can easily be adjusted so as to facilitate the cutting of laid and tangled grain. This machine has a very simple method of altering the height of cut by a hand wheel which is placed towards the front, easy of access and expeditious in its operation; a new patent draught arrangement for equalizing the strain on the machine and reducing side draught; fingers with steeled cutting surfaces, of a new open pattern, for readily getting rid of the accumulations which usually gather under the sickle; gun-metal bushes of the best quality in all important bearings, to which are affixed efficient lubricators, properly capped. Altogether the "Omnium" is worthy the praises it has received from British and Continental farmers.

The "Original Self-Raking Reaper," manufactured by Messrs Samuelson & Co., still maintains its ground as one of the simplest, strongest, and best that has yet been produced. It will stand any amount of wear without shewing stress on the roughest ground, and from breakage it may be said to be free. Several valuable improvements have been made upon it recently. It is now fitted with self-cleaning fingers of the open pattern, which prevents accumulation under the sickle. These new fingers are of welded steel and iron, and are practically indestructible. A new near-side shoe and sickle slide, giving great facility for removing the sickle without the use of bolts; new and improved means of rapidly raising and lowering the height of cut; means of putting in and out of gear by the driver's foot; some changes in the raking apparatus and platform, whereby a better formed sheaf is produced than heretofore; a head lifter working in conjunction with the rake, which is perfect in its action; and the off-side is fitted with a simple arrangement of swivel wheel which facilitates turning on soft land, and prevents the cutting up of the surface at the corners. (Fig. 56.)

The other reapers manufactured by Messrs Samuelson & Co., the "Eclipse," the "Handy," and the "Scotsman," maintain as manual-delivery machines like claims to excellence as the self-rakers. Messrs Samuelson & Co. have added to these machines jointed corn lifters, which are very useful in laid crops for raising the corn to the blades.

MESSRS HORNSBY & SONS' REAPERS AND MOWERS.

About Messrs Hornsby & Sons' reapers and mowers nothing can be said beyond this, that they have gained distinction in every field in which they have competed. They are light in draught, and cut cleanly alike on corn or grass. It is no light boast for the Messrs Hornsby & Sons to say that, during the last twelve years, they have gained more awards from the Royal Agricultural Society of England than any other firm—twenty-six against five by their nearest competitor. The awards they received amounted to £373 in that space of time.

The "spring balance" self-raker reaper of Messrs Hornsby & Sons is an invention which is peculiarly their own; the machine, and the man who drives it, being carried on a spring, which prevents jolting, and lightens the weight on the horses. By a recently patented arrangement, the rakes in this machine are made to revolve from two different centres. Each arm is fitted with a rake-head, so that each rake can be made to act as a deliverer, or merely as a gatherer, as may be desired. This change is made in a few moments, by detaching them from one and attaching them to the other centre, so that all delivery rakes are controlled by the lower centre, and all rakes acting only as gatherers are controlled by the upper centre, which, being carried more forward than the lower one, has the effect of pressing the gatherers down and forward, so as more effectually to gather the crop to the knives when it is much laid. These machines can be fitted with either four or six arms, and by varying the number of rakes and gatherers, the sizes of the sheafs delivered may be altered, viz., with four-arm machine one, two, or four (the latter being equal to a swathe), and with the six-arm machine one, two, three, or six sheaves (the latter being equal to a swathe) to one revolution of the arms. We give an illustration of the four-arm machine (fig. 57), although Messrs Hornsby & Sons themselves prefer the six. It is a mere matter of choice.

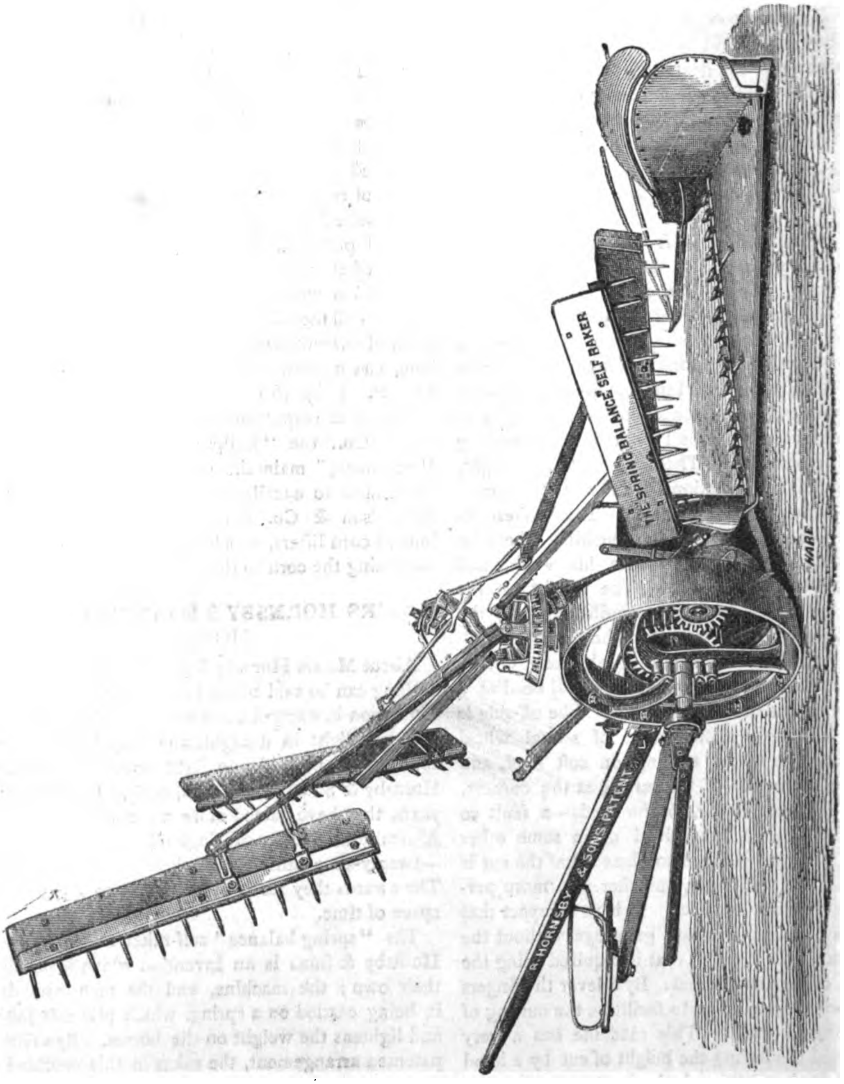

THE SPRING BALANCE SELF RAKER
R. HORNSBY & SONS PATENT
HARE

Fig. 57.—Messrs Hornsby's "Spring Balance" Self-Raker.

MESSRS D. M. OSBORNE & CO.'S MOWERS AND REAPERS.

Messrs Osborne & Co., 15 Queen Anne Street, Liverpool, produce reapers and mowers remarkable for their lightness of draught, superiority of construction, and clearness and cleverness of cutting. One of the fundamental principles in Messrs Osborne & Co.'s machines is direct draught. The pole is bolted to the front of the frame, and the knives are exactly at right angles therewith. By this principle of direct action and freedom from friction in the gearing and bearing, the No. 1 mower manufactured by the Messrs Osborne & Co. is, while it gives a full breadth of cut, very light withal. This machine possesses two distinct features in construction, viz., the axle-plate motion and flexible-bar combined upon principles which admit of the cutting apparatus conforming, without injury, to the inequalities of the ground. The machine shaves the grass as cleanly as a well-trained barber could take off the beard. Another feature, and an important one, in connexion with the mower is that it is easy of management. The driver has it entirely under his control. With a lever convenient to his hand, he can raise the cutter-bar over any obstruction ; and should the horses threaten to run away, with a movement of his foot he can throw the machine out of gear, and so prevent the danger that would ensue from the knives being in motion.

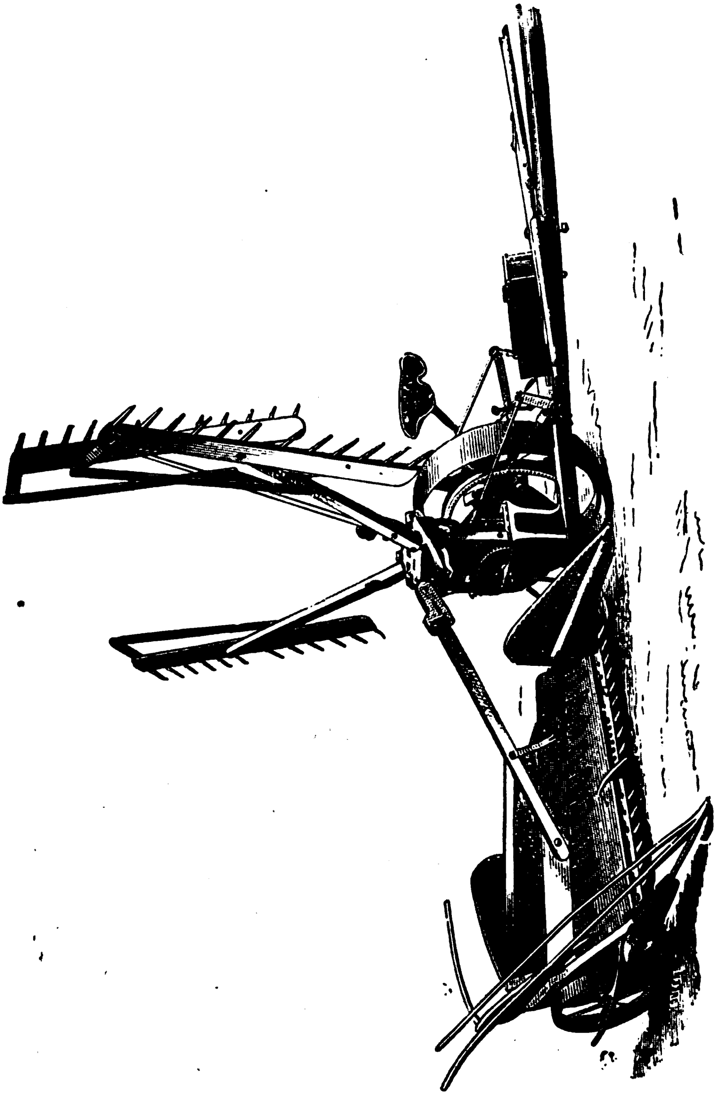


Fig. 58.—Messrs Picksley, Sims, & Co.'s Self-Raking Reaper, the "Novelty."

Messrs Osborne & Co.'s single-delivery reaper inherits all the old admirable qualities of the Kirby. The machine is fitted with rolling head-rakes, which are transformed into reels at pleasure. By an ingenious arrangement, the weight of one rake-arm in descending counterbalances the other ascending, thus saving the heavy pressure upon the horses which rakes on other principles occasion. The rakes have an easy continuous motion, rendering them little liable to breakage. The sweep of the beaters down before the cutters is such as to give them a good grasping hold of the grain at the moment they reach the knives ; then, as they pass over the finger-bar as beaters, they are turned well up and the grain falls even and straight upon the platform, and the sheaf is gently swept off by the rake. The working parts are of mallable iron, as, indeed, are all on the machines of this firm.

Messrs Osborne & Co.'s self-combined mower and reaper is an extremely handy and handsome machine. Its chief characteristics are simplicity and lightness.

It cuts easily even on rough and stony ground. In all these machines it should be observed that, by a simple arrangement, the platform is folded up so as to admit of the ready passage of the machines through a field gate.

MESSRS PICKSLEY, SIMS, & CO.'S REAPERS AND MOWERS.

Messrs Picksley, Sims, & Co. (Limited), Agricultural Engineers, Bedford Foundry, Leigh, Lancashire, turn out from their establishment workmanship of the very best class for excellence and design, strength of construction, with lightness of draught and assuredness of durability. In fact, the machines, it might almost be hinted, are a little too durable for the profits of the manufacturers; for it is so long a time, after a farmer has purchased any of Messrs Picksley's manufacture, before he requires another—the wear and tear in them, by skill and care and the use of the best material, being reduced to the lowest possible point. Their "Novelty" self-side-delivery reaper is a splendid machine, bearing out our remarks in the ALMANACK of 1878, that Messrs Picksley, Sims, & Co. were "fertile in invention, and never weary of well-doing." During the past year, this enterprising firm have introduced several new machines. For the superiority of their agricultural machines generally, Messrs Picksley, Sims, & Co. were honoured with a gold medal at the great International Exhibition at Paris, which makes 616 first prizes that have been awarded them: foremost is the new Novelty self-side-delivery reaper, previously referred to. (Fig 58.) This

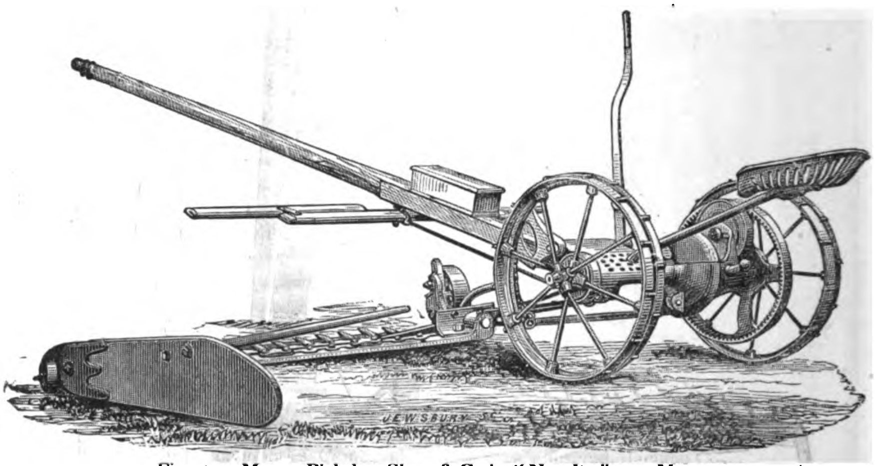


Fig. 59.—Messrs Picksley, Sims, & Co.'s "Novelty" as a Mower.

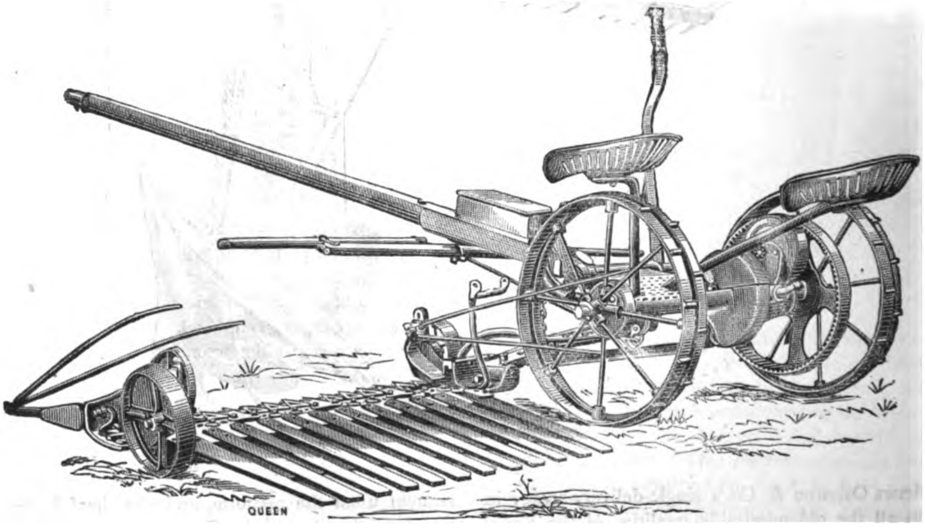


Fig. 60.—Messrs Picksley, Sims, & Co.'s "Novelty" as a Reaper.

new reaper (although merely put into the trials of the past season for experimental purposes), has been awarded several first and important prizes in the great public reaping contests held in Great Britain, in competition with the machines of the leading makers. A brief description of this reaper will be interesting to our readers. The gearing is thoroughly protected, and so arranged that the machine is almost noiseless when at work, the rakes are controllable, and the delivery of the cut grain is perfect. It is light in construction, steel, wrought, and mallable iron being used in all parts requiring strength, so as to insure durability with lightness. The driver upon the seat has complete control of the reaper and the rakes. The seat is so arranged that the driver takes off all weight from the horses' necks, which is a matter of very great importance, as it saves horse-flesh, which cannot be bought very cheaply even now, although not quite so dear as it was. There is no side draught, and the general draught is reduced to the lowest possible minimum. The cutting is perfection, and the height of the cut can be changed by a very simple arrangement and with the utmost ease. The platform can be turned up for transport on the road, and when so arranged, the reaper will pass through an ordinary gateway. Altogether, this reaper appears a very desirable machine for the farmer.

The "Novelty" two-horse mower and combined mower and reaper, manufactured by this firm, has been before the public for several seasons; and, for the purposes for which it is adapted, it possesses all the essentials requisite for a machine of its class to be of utility and service to the farmer. This machine has all the improvements which Messrs Picksley, Sims, & Co. deem necessary, from an extensive experience and practical tests, to render it complete and perfect, by attending to the important points of lightness in draught, simplicity, durability, and efficiency.

We give illustrations (figs. 59 and 60) shewing the machine both as a mower and as a reaper.

MESSRS JOHN WILLIAMS & SON'S REAPERS AND MOWERS.

The reaping and mowing machines of Messrs John Williams & Son, judging from the important awards made to them at some of the principal trials and agricultural societies' shows, can be recommended as good and efficient machines. These machines are in use throughout the country, and are giving great satisfaction. They are noted for simplicity of construction, lightness of draught, strength and durability, ease of management, and lowness of cut. A great feature in these machines is the finger-bar. A groove is placed on the bar to admit of the bottom sections being riveted on this parallel surface on the bar and not inside the finger. Advantages gained: At all times a sharp cutting resistance similar to shears; the bottom sections being riveted on a planed surface, the top knife at all times works dead upon them; the bottom section being independent of the finger, it can be sharpened when required. In the case of a finger being broken, the bottom section remains intact on to the bar. The fingers are all made of the best mallable iron. As a proof of the

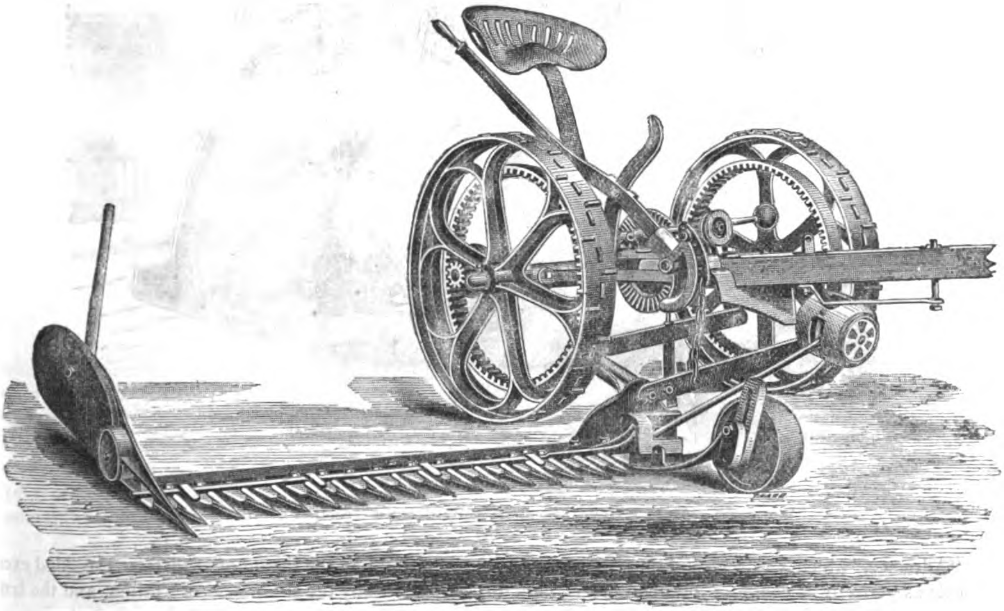


Fig. 61.—Messrs John Williams & Son's Mower.

superiority of this finger bar, the judges of the Manchester and Liverpool Agricultural Society (Chester Meeting, 1873), and also the judges of the Royal North Lancashire Agricultural Society (Chorley Meeting, 1873), awarded a silver medal to the finger bar in each of the above trials, which was the only one recognized. (See fig. 61.)

MESSRS J. & H. KEYWORTH & CO.'S ADRIANCE SELF-RAKING REAPER.

Messrs J. & H. Keyworth & Co., of Liverpool, whose "Buckeye" was a successful worker, have introduced a new one-wheel reaper called the "Adriance," which is a strong and simple machine that cuts as perfectly as could be desired. It is light in draught. The rake works on a similar principle to that of the Buckeye, and the arms can be used as rakers or gatherers at pleasure. The Adriance works automatically, and is perfectly under the control of the driver. The frame is of iron, and so contrived as to cut at any desired height. A lever at the right hand of the driver enables him to tilt the platform so as to cut laid corn. The driver's seat is a safe one on the outer side of the road-wheel. The machine is well balanced, relieving the horses considerably. The platform is made to turn up; and while being turned up, a simple arrangement enables it to balance itself. We give an engraving shewing the machine adapted for travelling along the road (fig. 62).

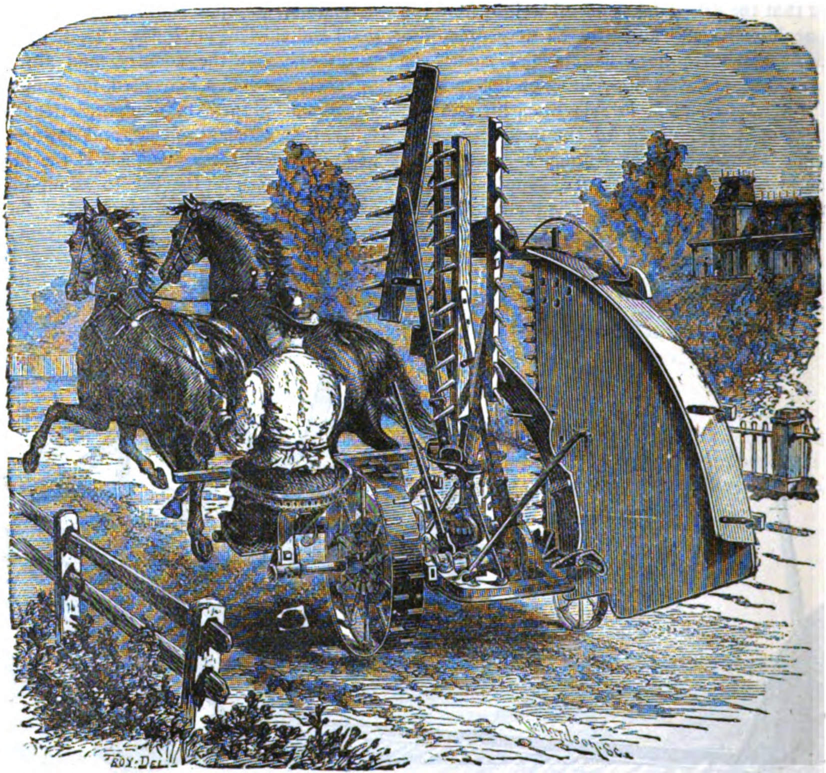

ROY. DEL.
Richardson Sc.

Fig. 62.—Messrs Keyworth & Co.'s "Adriance" Reaper on the Road.

MESSRS HARRISON, McGREGOR, & CO.'S ALBION MOWERS AND REAPERS.

Messrs Harrison, McGregor, & Co., Albion Ironworks, Leigh, Lancashire, manufacture mowers and reapers of first-class quality. Their great points are strength of construction with lightness, durability without any lumbering metal about them or complicated parts. In 1877, Messrs Harrison, McGregor, & Co.'s machines were marvellously successful; in the season of 1878 they exceeded even themselves by the cleanliness of cutting, and the tenderness their new arrangement shewed to the horses. In Messrs Harrison & McGregor's machine, a slight increase in the speed of the knife has recently been made. An improved mallable-iron mowing shoe, inlaid with a steel plate for the knife to cut against, has been added; a new finger-bar, fitted with steel-lined mallable-iron fingers, of a new open pattern, combining a perfect shear cut with strength, making them less liable to clog in old meadow or difficult crops; also a new form of knife and knife-heel guide, with improved connecting rod and knife-holder, and a balance crank-wheel easy of oiling. The machine has been more perfectly balanced, and by a new arrangement of Messrs Harrison, McGregor, & Co., the points of the fingers can be instantly raised or lowered while the machine is at work, so as to pick up laid crops in working on uneven ground. It can readily be transformed into a reaper. (Fig. 63.) During the past season, Messrs Harrison & McGregor brought out an improved "Albion" self-delivery reaper, which is extremely simple and handy to work, and it lays the corn after it has shaved it cleverly in well-shaped sheaves. It was out at four competitive trials last year, and in each it carried off the prize, as its merits entitled it to do.

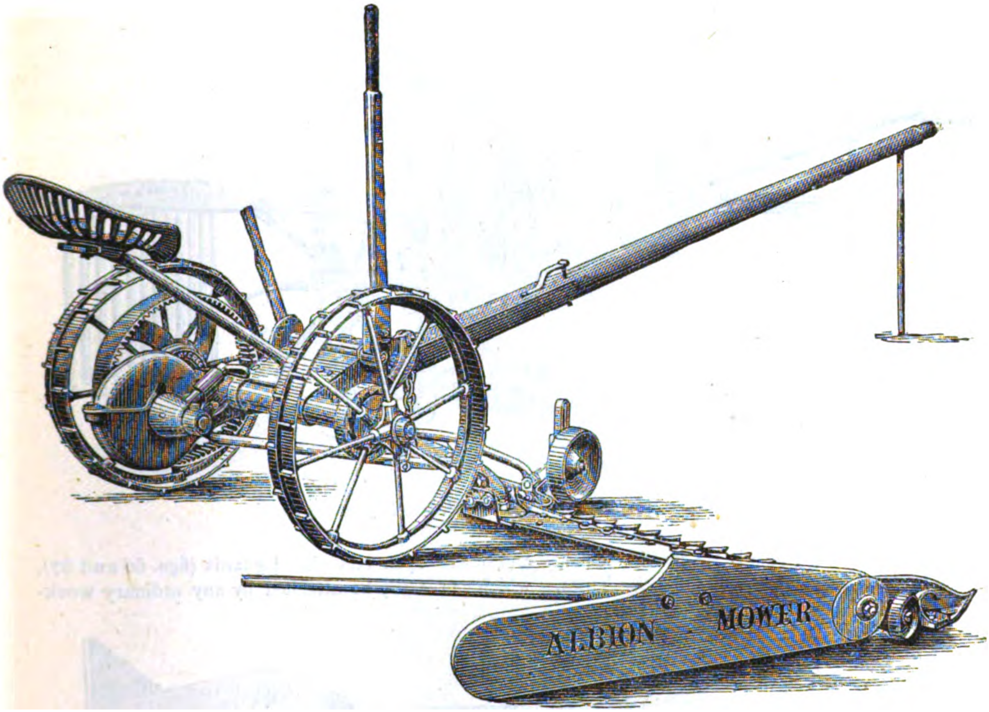


Fig. 63.—Messrs Harrison, McGregor, & Co.'s "Albion" Mower.

MESSRS PENNEY & CO.'S POTATO DIGGER.

Messrs Penney & Co. (Limited), Lincoln, manufacture an excellent potato digger. The machine is drawn by a couple of horses, and is carried (together with the driver) on a pair of large wheels, which take the weight of the whole of the gear, and by their rotation impart the required motion to it. The loosening of the ground is effected by a powerful and broad knife, bent to the required shape, so as to pass completely beneath and partly lift up even the deepest roots. Behind the knife is a wheel with eight prong-shaped arms, which is revolved by a simple bevel gear, the "pinion" being secured to the same shaft as the eight-pronged wheel, and the bevel "wheel" being mounted on the main axle and driven from the road wheels. A small thin wheel or disc, in front of the large knife, as clearly shewn, assists in dividing the ground vertically, and thereby lessens the work on the knife. The prongs of the revolving wheel cut off the tops and strew the potatoes on the ground ready for collection and bagging, a screen suspended from the main framing preventing them from being thrown too far, and separating them from the loosened mould. By a lever within easy reach of the driver, the knife, disc, and prongs can be raised clear of the ground for travelling, or adjusted to any required depth to suit the crop under operation. By a suitable clutch, moved by the same lever, the bevel wheels can be thrown out of gear with the road wheels, and the prongs thereby prevented from revolving. The machine is highly ingenious, and, although it has been before the public less than two years, has already been widely applied, and met with general approval. It is capable of digging 3 to 4 acres of tubers a day. (Fig. 64.)

THRASHING MACHINES AND ELEVATORS.

MESSRS HORNSBY & SONS' THRASHING MACHINES.

Messrs Hornsby & Sons' thrashing machines stand well in the eyes of the agricultural world. The cranks of the shaker and vibrating boards are case hardened, and made in parts, so that, should they, perchance, happen to break, they are easily replaced at little cost. The thrashing drum is reversible; the connecting-rods of flexible wood of the best character, and the vibrating boards compact, involving little loss in wear and tear. These machines are also provided with a competent hood to keep the attendant from any danger, and fitted with an adjustable screen, which greatly improves the quantity and quality of work. It disposes of all that is bad, and conserves the good. We give illustrations of the thrasher (fig. 65), and of the open and closed guards (figs. 66 and 67), which can easily be attached by any ordinary workman to all Messrs Hornsby & Sons' machines; and guards of some kind are, by Act of Parliament, January 1, 1879, compulsory on all machines from

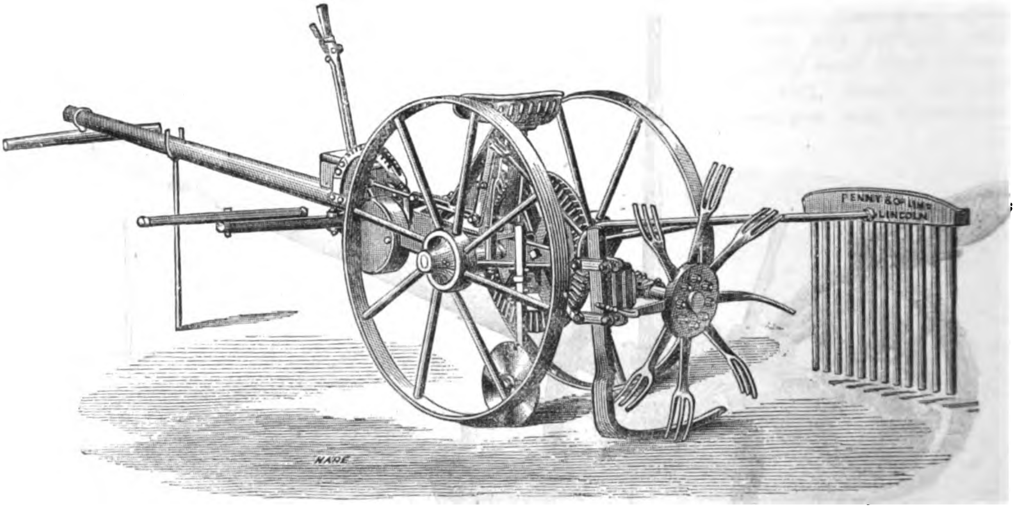


Fig. 64.—Messrs Penney & Co.'s Potato Digger.

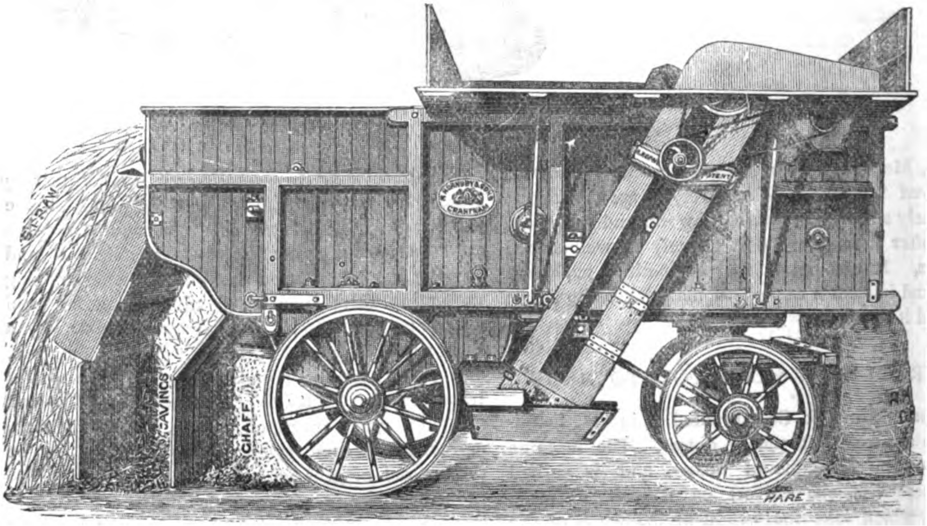


Fig. 65.—Messrs Hornsby's Thrashing Machine.

MESSRS CLAYTON & SHUTTLEWORTH'S THRASHING MACHINES.

The thrashing machines of Messrs Clayton & Shuttleworth, Lincoln, have been widely appreciated by all farmers who grow corn. Early in the history of the make (recent manufacture, of course, we mean, the first thrasher having been made in Scotland about 1787) of improved thrashing machines, Messrs Clayton & Shuttleworth came to the fore. This firm, in 1849, introduced a combined machine for thrashing and finishing the grain for market—a machine of which the judges of the Royal Agricultural Society of England highly approved at their exhibition at Lewes in 1852. In three years, therefore, Messrs Clayton & Shuttleworth had made their mark. The judges of the Royal admitted that the firm was in advance of the Society when they awarded them the first prize at the Lincoln meeting in 1854. Since 1849 they have been continuously improving upon their portable thrashing machines. Economy of labour in management, lessening of power in driving, strength, and durability, and, above all, efficiency in working, are what they have aimed at and succeeded in ob-

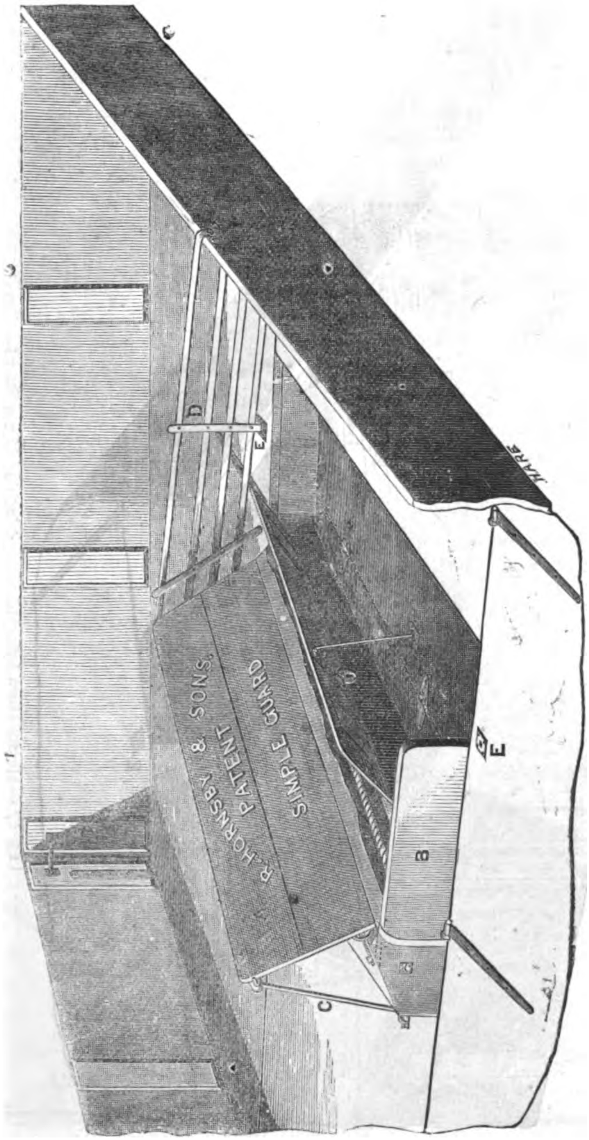


Fig. 66.—Messrs Hornsby's Thrashing Machine Drum Guard—Open.

taining. In all their thrashing machines, Messrs Clayton & Shuttleworth are careful to see that all the timber with which the framework of their machines is made is thoroughly seasoned, that the bearings are of the best ash, and all the iron and steel work about them and the gearing parts selected from the best materials. The drums are balanced to a nicety, saving loss of power. The straw-shaker on the machine separates the grain from it most effectually, and can also be made to send forth the straw straight and unbroken, which is an important matter when it has to be sent to market instead of being consumed on the farm, and even in the latter case the "shakers" save waste. Four separations of the grain are made in the first dressing apparatus, viz., the cavings and short straws; the chaff, sproutings, stones, and rubbish generally; and small seeds of weeds, sands, &c. After these processes, the corn is transferred to the top of the machine and delivered by a cup or blast elevator, whence, after passing through an awning and smutting apparatus, it comes down into a second dressing apparatus (on the finisher, which we illustrate, fig. 68), consisting of a series of riddles through which the corn percolates while being acted upon by

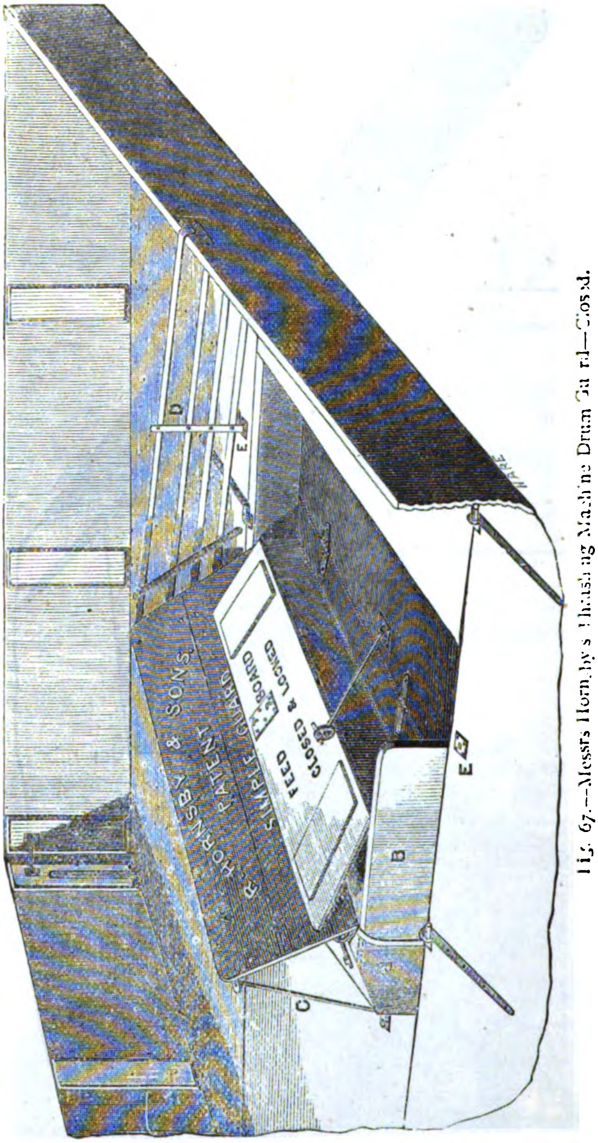


Fig. 67.—Messrs Hornsby's Thrashing Machine Drum Guard—Closed.

a blast which carries away the beards, chaff, smut, &c. A separate sprout conveys refuse of all kinds to the ground. No good grain can escape, and an adjustable rotary screen sorts it into three qualities, the size of the corn in each being determined by the adjustment of the wire screen, which is quite easily effected.

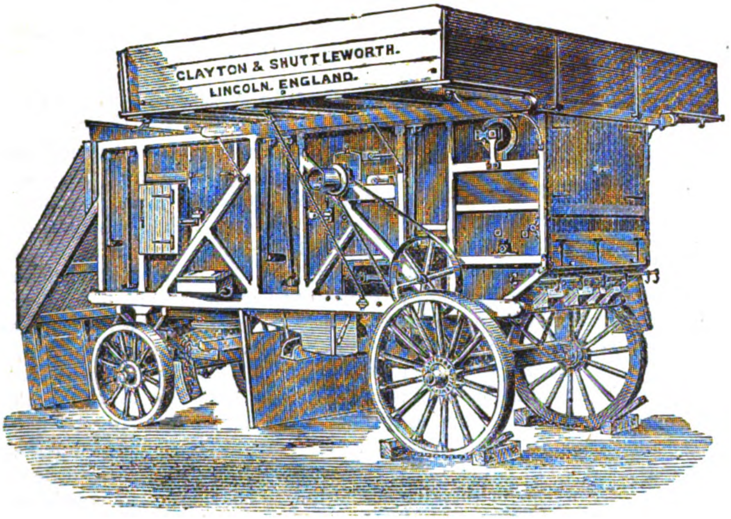

CLAYTON & SHUTTLEWORTH.
LINCOLN. ENGLAND.

Fig. 63.—Messrs Clayton & Shuttleworth's Thrashing Machine.

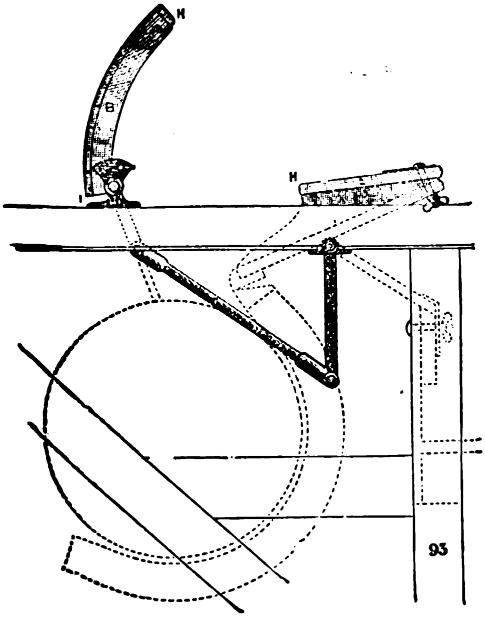


Fig. 69.—Messrs Clayton & Shuttleworth's Drum Mouth Open for Feeding.

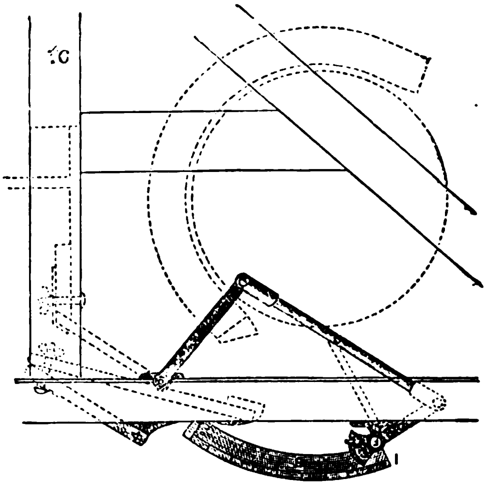


Fig. 70.—Closed.

Several years ago Messrs Clayton & Shuttleworth adopted Wilder's patent self-acting apparatus for the prevention of accidents to the people employed on the machines. The Act of Parliament, which comes into force in August this year, determines that all thrashing machines must have a drum guard. We give illustrations of Messrs Clayton & Shuttleworth's drum guard (figs. 69 and 70), which gained the silver medal at the Liverpool Show of the Royal Agricultural Society of England. The engravings represent the drum open and shut. The guard B can be set, as may be desired, to overhang the drum-mouth more or less when open, by adjusting the quadrant and thumb nut seen at E.

Messrs Clayton & Shuttleworth's straw elevator is adapted for stacking straw from the thrashing machine at any angle up to an altitude of 25 feet. It can easily be wrought by a one-horse gear.

MESSRS RUSTON, PROCTOR, & CO.'S THRASHING MACHINES.

Of Messrs Ruston, Proctor, & Co.'s (Sheaf Ironworks, Lincoln) engines we have spoken in another department of the ALMANACK. In thrashing machines they have few equals. Our space will not permit us to enlarge upon their capabilities, which may be summed up in a few words. They are strong and durable, and the power required to drive them has been reduced to the minimum by the excellence of the general design. The illustration (fig. 71) we give represents one of Messrs Ruston, Proctor, & Co.'s combined thrashing machines, which finishes the grain for market at one operation. The machines can be used at pleasure as "single blasts," as may be desired, without loss of time or changing of parts; and easy access is afforded to all the working parts, for lubricating, adjustment, or repairs, and as the motions are all governable, they are equally well adapted for working upon any kind or condition or quality of corn. The operations performed are—thrashing, bolting, winnowing, riddling, barley horning, smutting, straw shaking, separating the grain into perfect samples of the several qualities, and delivering it into sacks, and, when required, cleansing and elevating the chaff.

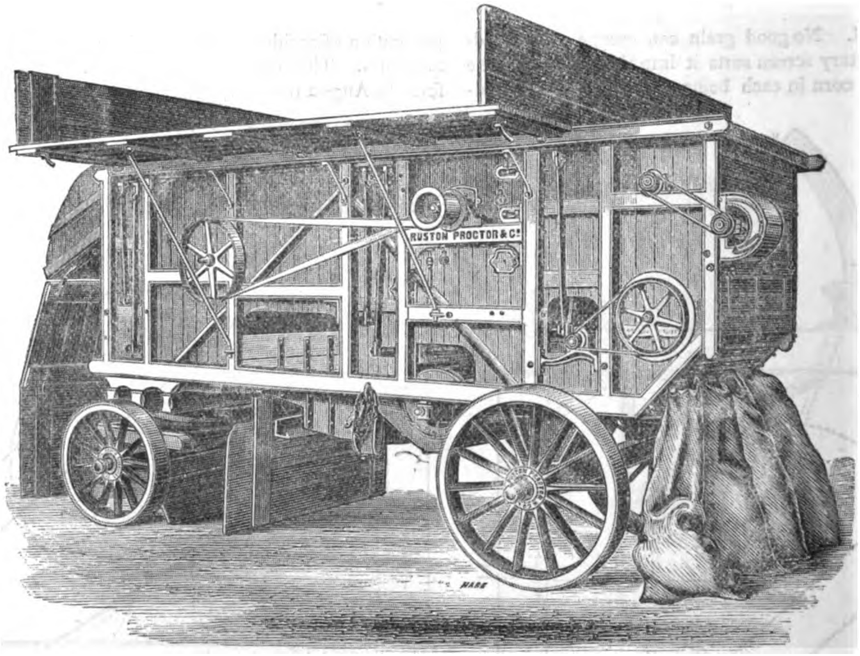


Fig. 71.—Messrs Ruston, Proctor, & Co.'s Combined Finishing and Thrashing Machine.

MESSRS ROBEY & CO.'S THRASHING MACHINES.

This firm have long been celebrated for the excellence of their thrashing machinery. They make thrashing machines a special study, and have succeeded in producing a machine which is unsurpassed for its lightness and strength. The frame of Messrs Robey's machine is made of wrought angle iron, which is stronger than any frame made of wood, and is perfectly true and rigid under all weather conditions. The machine, with this frame, is easily driven, owing to the constant truth of all the bearings; and on account of its steadiness when at work, and the absence of vibration, all the working parts continue in good condition for a greater length of time than otherwise they would. Although specially designed for foreign countries and hot climates, the iron frame is manifestly superior to a wood one in any country, particularly when a machine has often to be moved about. In addition, the peculiar form of this frame, and the method adopted in its construction, enable it to withstand most effectually the straining or twisting motion incidental to travelling over rough roads, and to retain throughout its original accuracy of form. After a three days' careful trial of the machine, the Committee of the Highland and Agricultural Society of Scotland reported the machine "to embrace many improvements, chiefly the reduction of the weights of the shoes and riddles, and having enlarged bearings for the spindles. The lower part of the framework is also left open, so as to shew the working parts, which is an advantage in regard to attention. The Patent Self-Feeding Apparatus consists of a covered hopper on the top of the thrashing machine, containing a shaking board, on which the crop falls as it is filled in, and means of adjustment are provided to regulate the quantity of feed. There is a lever close to the attendant, so that the machine can be quickly stopped if required. The price of the machine is £160. The machine was driven by one of Messrs Robey & Co.'s 6-horse power traction engines, and the quantity of grain finished for the market per hour was 6 qr. "The

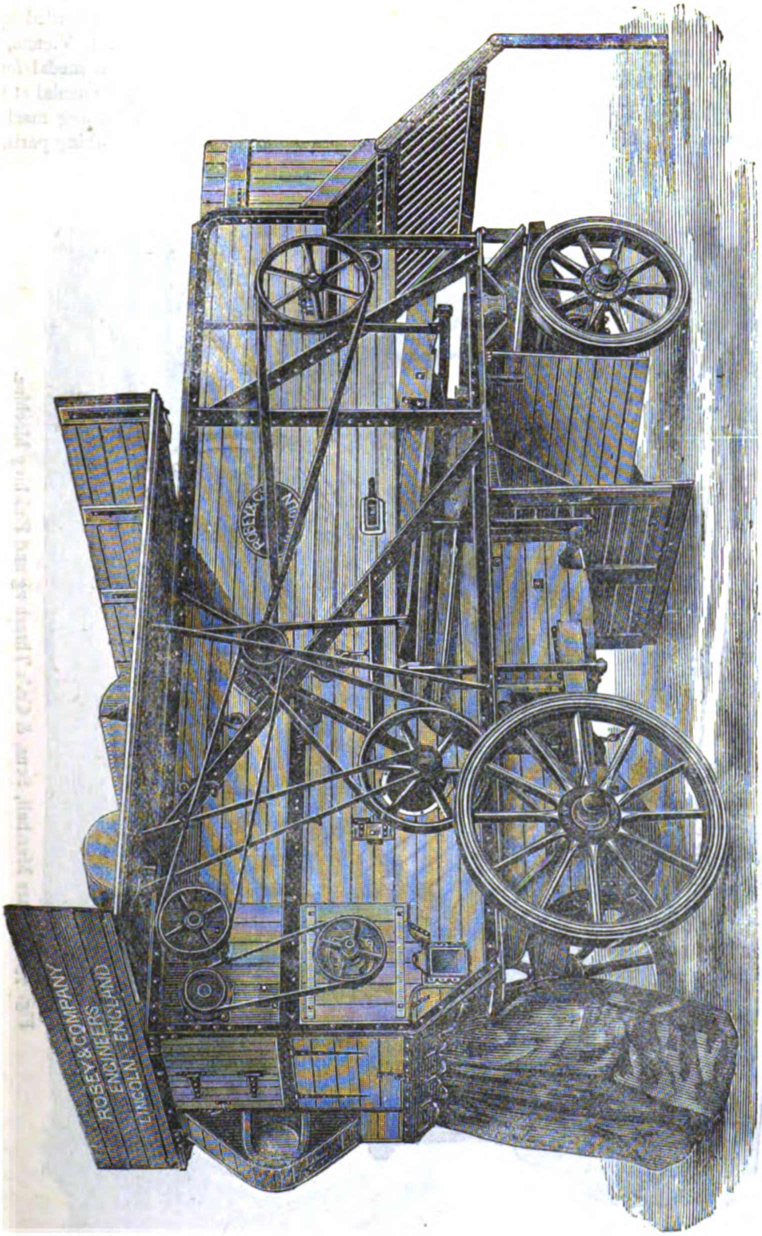


Fig. 72.—Messrs Robey's, Iron-Frame, Thrashing Machine.

Committee consider that the work done was most satisfactorily performed; that the various improvements which have been introduced, especially the new feeding apparatus, are most ingenious and likely to be useful, and think it worthy of the Society's Gold Medal." (Fig. 72.)

MESSRS MARSHALL, SONS & CO.'S THRASHING AND FINISHING MACHINES.

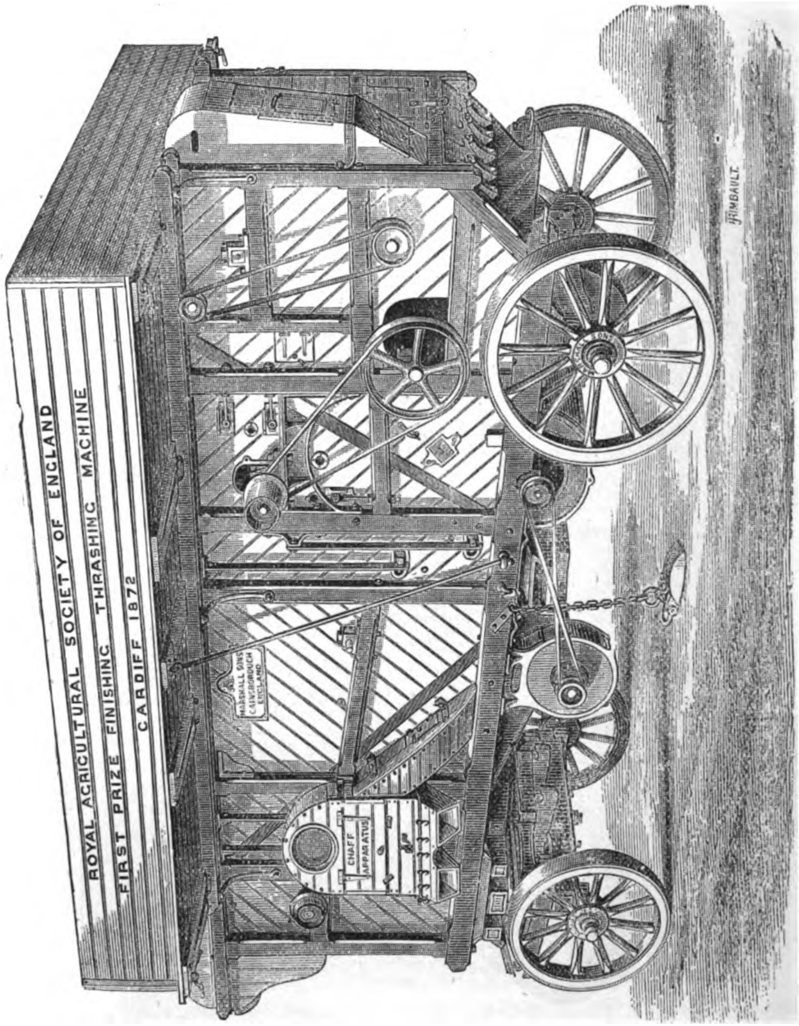

ROYAL AGRICULTURAL SOCIETY OF ENGLAND
FIRST PRIZE FINISHING THRASHING MACHINE
CARDIFF 1872
MARSHALL SONS & CO GAINSBOROUGH ENGLAND
CHAFF APPARATUS
J. RIMBAULT

Fig. 73.—Messrs Marshall, Sons, & Co.'s Thrashing and Finishing Machine.

Messrs Marshall, Sons, & Co, of the Britannia Ironworks, Gainsborough, make a steam thrashing machine which has been highly appreciated in this country, on the Continent, and the Colonies. The prizes they have gained at home are almost too numerous to mention. At Cardiff Royal, 1872, they took the first prize of £40 for best finishing thrashing machine; also first for straw elevator. At the Yorkshire Show they obtained the £50 prize in 1865, and since that time their home conquests have been legion at provincial shows. On the Continent they have taken many gold medals, including two at the Paris Universal Exhibitions of 1878 and 1867, and three at the Hague, as well as a special prize awarded by Queen Victoria, who is patroness. At Vienna, Messrs Marshall, Sons, & Co. received a medal for merit; and in Dunedin they took the prize medal at the New Zealand Exhibition. These thrashing machines are compact in design, and all the working parts, including being fixed within the frame, are protected from the weather, and are not deranged in travel. They are strong, yet simple in construction throughout. The drums and breast-work are all wrought iron; the drum spindles, also the shaker and shoe cranks, are steel, and the framing best dry seasoned oak, with cast-iron drum sills, diagonal lining boards, and wrought-iron tension stays, which insure thorough rigidity and much enhance their durability. The working parts are not liable to derangement, the vibrating shoes being suspended on spring hangers, and driven by spring rods, thus reducing the number of oiling and wearing places. The bearings of the revolving shafts are made of extra length, fitted with substantial brasses, and carefully protected from dust and dirt. Easy access is afforded to the internal details of the machine, which effects the various separations without injury to corn or straw, and the sample of grain

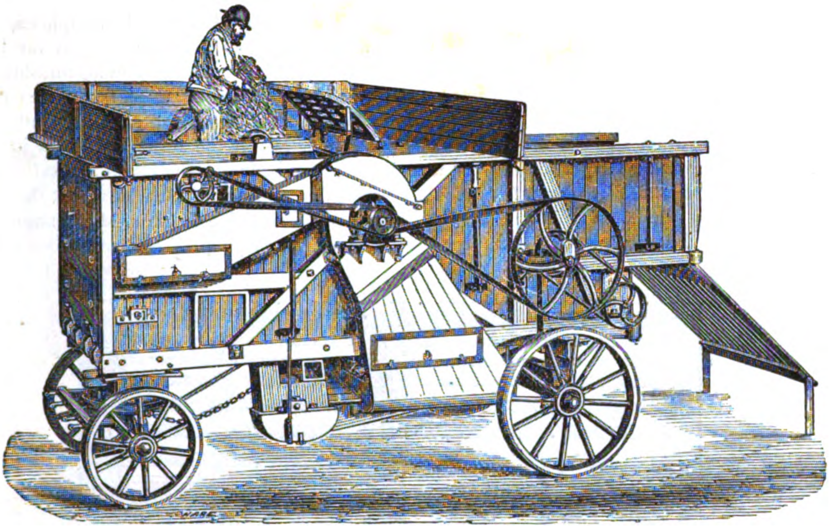


Fig. 74.—Messrs Garrett & Sons' Combined Thrashing and Corn-Dressing Machine.

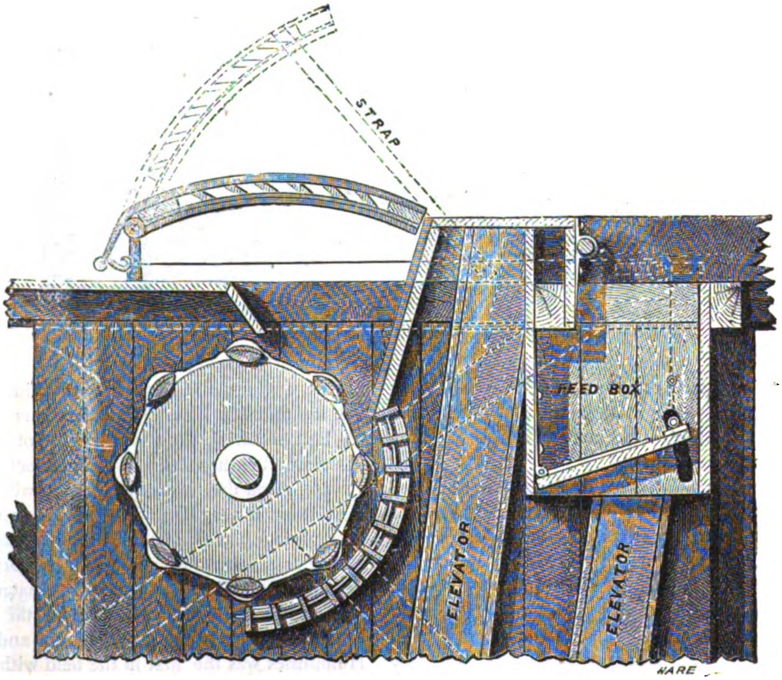


Fig. 75.—Messrs Garrett & Sons' Self-Acting Drum Guard—Longitudinal Section.

it turns out is very perfect, bright in colours, and uniform in sample. We give an illustration (fig. 73) of this thrashing machine.

MESSRS RICHARD GARRETT & SONS' THRASHING MACHINES.

These thrashing machines are constructed upon the principle of Garrett's well-known patent, in which the fan is attached to the drum spindle, and the blast is carried through wide wind passages for one, two, or three dressings, without additional machinery. By thus dispensing with the extra spindles, bearings, pulleys, and driving belts employed in the dressing apparatus of ordinary combined machines, the wear and tear is reduced to a minimum, as also are the weight and bulk of the machine. We illustrate such a combined machine (fig. 74).

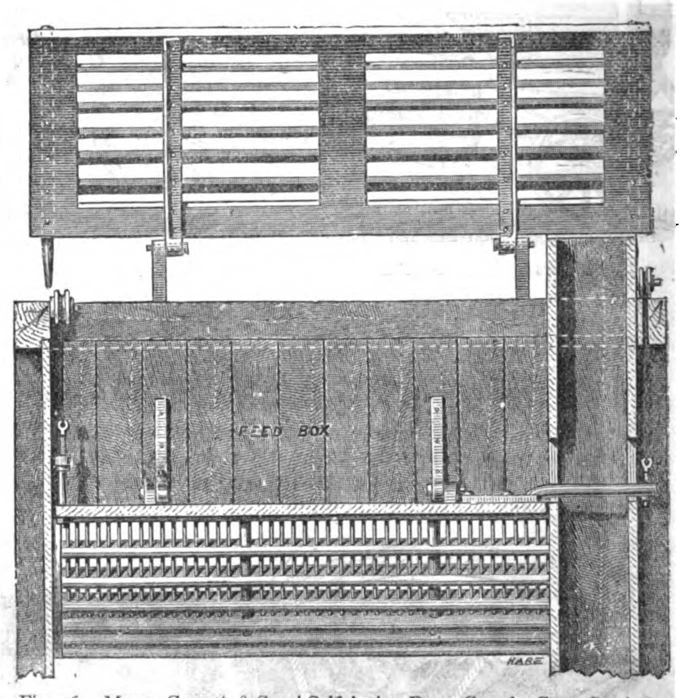


Fig. 76.—Messrs Garrett & Sons' Self-Acting Drum Guard—Cross Section.

All Messrs Garrett's thrashing machines are fitted with their patent self-acting drum guard, which obviates the chance of accidents to the feeders of the machines. By Act of Parliament, it is now imperative that all thrashing machines should be fitted with drum guards, and Messrs Garrett's is one of the best. It is perfectly self-acting. It is so arranged that upon the feeder leaving his seat, the hood instantaneously falls down upon the mouth of the drum, rendering accidents from falling down between the drum and concave perfectly impossible. We give illustrations (figs. 75 and 76) of the longitudinal and cross sections of this valuable invention.

MR EDWARD HUMPHRIES' THRASHING MACHINES.

Celebrated as Mr Edward Humphries, Atlas Ironworks, Pershore, Worcestershire, is for his portable engines, he is even more so for his thrashing machines, which have carried off many first prizes for their excellence of construction, strength, and efficiency in working, at all the principal shows in the United Kingdom, including the Royal Agricultural and Bath and West of England Societies. At the Great International Exhibition at Paris, Mr Humphries had the honour of carrying off a silver and a bronze medal for his engines and thrashing machines. We need not say that Mr Humphries' thrashers are made of the best material, the concave being of wrought iron; it has wood spring hangers and connecting rods; the elevators and dressing apparatus are within the framing; it has a very large caving riddle on Mr Edward Humphries' patent principle, which insures getting all the corn from the cavings. The corn is divided into the three usual separations by a patent adjustable screen, and delivered into sacks at the back of the machine, clear away from the straw and chaff. Mr Humphries was the first in the field with the double-blast thrashing, shaking, riddling, barley awing, winnowing, and sacking machines to finish the corn for market. We give an illustration of his double-blast patent combined machine (fig. 77), covered for removal, in order to shew its compactness.

MESSRS NALDER & NALDER'S THRASHING MACHINES.

The fame of Messrs Nalder & Nalder, Challow Ironworks, Wantage, as manufacturers of thrashing machines, is not confined to their own country; it has spread over the Continent. The main characteristics of their machines are excellence of material, good workmanship, lightness, simplicity, and efficiency in separating the grain. At the Royal Show at Cardiff, it will be remembered that Messrs Nalder & Nalder's thrasher did not leave 2 lb. of corn out of ½ a ton of straw. At Turin International, Messrs Nalder & Nalder gained, after a severe trial, two gold medals—one for their 8-horse power thrashing, bagging, and finishing machine, with patent self-feeder, and one for their neat little 3-horse power machine, which is admirably adapted for the requirements of small owners. Messrs Nalder & Nalder have been recently devoting their attention to a larger machine adapted to the great wheat-growing countries of Russia, Hungary, Roumania, &c. In the latter country they have been tried and not found wanting. The machines manu-

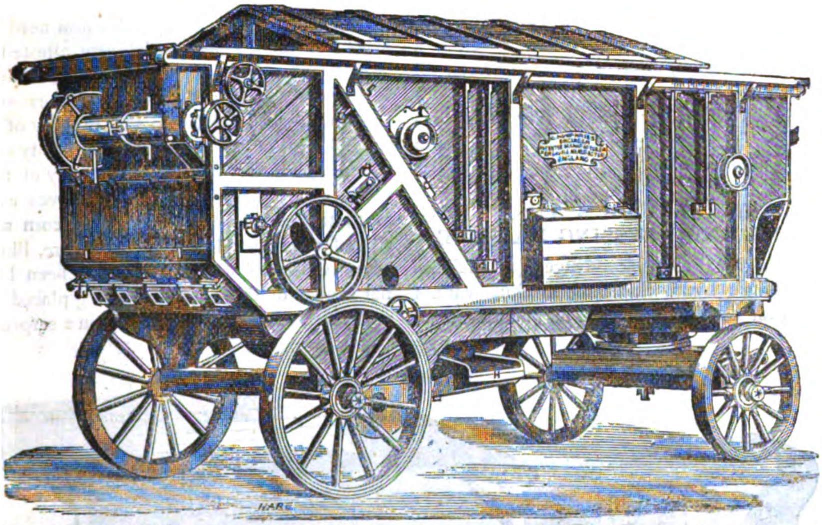


Fig. 77.—Mr E. Humphries' Combined Double-Blast Finishing Machine Covered for Removal.

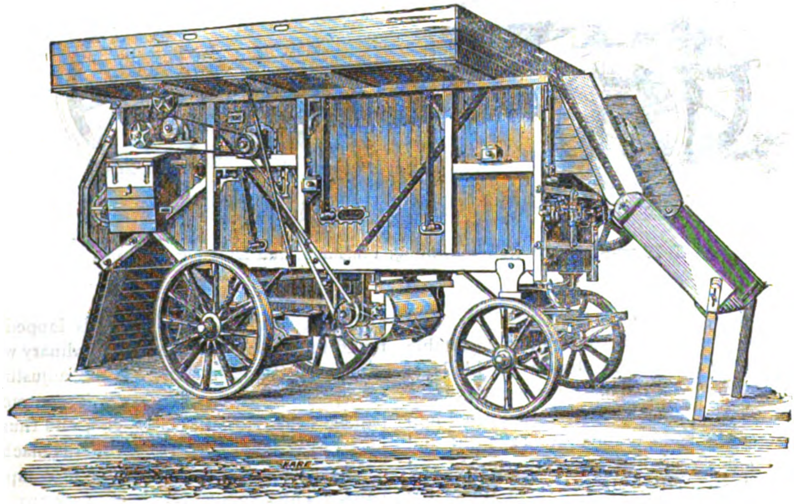


Fig. 78.—Messrs Nalder & Nalder's Single-Blast Thrashing Machine.

actured by this firm range from 2½ to 10-horse power (we leave out the specially large ones for foreign countries), which are capable of thrashing from 1000 to 1500 bushels a day. The single-blast machine (fig. 78) works easily and well, and has deservedly gained within three years no fewer than twenty-three gold and silver medals, including the prize of the Royal Agricultural Society. In connexion with these machines, Messrs Nalder & Nalder's corn screen is a most efficient implement, easily adapted to screen all kinds of grain.

Messrs Nalder & Nalder have a very capital arrangement for thrashing, dressing, and bagging corn for market at one operation.

MR FREDERICK SAVAGE'S THRASHING, FINISHING, AND DRESSING MACHINE.

The make of Mr Frederick Savage's (St Nicholas Ironworks, King's Lynn) thrashing machine cannot be surpassed for excellence of material and cleverness of workmanship. Particularly is the ingenuity noticed in the manner in which the separating and adjustable screens make three perfect samples in all kinds of grain. The chaff, cavings, and straw are delivered separately at one end, and the corn is delivered into sacks at the opposite end—quite clear of the dirt and dust. The frames are made of best English oak, and the boards run horizontally with the main sill of the machine, so cannot possibly get out of accuracy in working. The machine, which we illustrate (fig. 79), can be arranged to work as a double blast, by passing the corn into the sacks instead of through the screen; or as a single blast, by removing the riddles from the second dressing apparatus, and by stopping the small blower. Each machine is mounted on strong wood travelling wheels, with cups to hold oil, screw hammer, a set of small straps, oil tin, and waterproof cover; and is fitted with a drum guard.

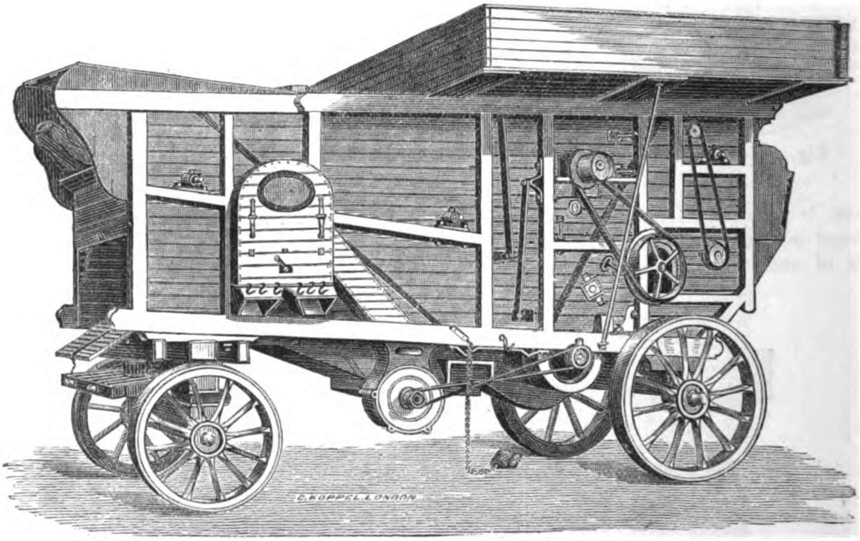


Fig. 79.—Mr F. Savage's Thrashing, Finishing, and Dressing Machine.

MESSRS HORNSBY & SONS' CORN SCREENS.

The rotary corn screens of this firm need little comment from us. Their merits were attested to by the Royal Agricultural Society's judges at the Bury St Edmund's Show. Here is what they said:—"In this division of implements the rapidity of the work, the lightness of the power, the simplicity of the construction, and the decided superiority of the sample produced by Hornsby's screen removed every doubt as to the award. This new rotary corn screen consists of a simple cylinder of coiled wire, like the ordinary fixed-mesh screens that have been long used; but instead of the cross-bars being placed longitudinally, they are placed diagonally, in a serpentine form and each separate coil of wire is lapped or bound round the outside of them in the ordinary way of wire-stitching. Then, by bringing the adjusting-screw to act upon the whole cylinder, it is contracted or expanded equally from end to end, and thus easily adjusted to suit grain of any size. This machine affords a larger screening-surface without complication of parts. Three competitors being very anxious to have their screens tested with barley, we allowed the competition. This second experiment more fully convinced us of the already proved superiority of principle and construction in Hornsby's, with its ready adaptation and its simple cylinder." We give an illustration of this machine (fig. 80).

MESSRS MARSHALL, SONS, & CO.'S STACKING MACHINE AND STRAW ELEVATOR.

Messrs Marshall, Sons, & Co. have succeeded in producing an admirable stacking elevator—compact, efficient, and not liable to get out of order. In this machine the upper half of the carrying trough is arranged to turn over and lay on the top of the lower half, instead of being drawn into it; thus the very frequent occurrence of the upper portion of the trough becoming fastened in the lower part through frost and other causes, and consequent breaking of chains and disabling of the elevator in attempts at liberation, are entirely obviated and greater durability thereby insured. Their machines will deliver at any angle, according to size, to a height of from 25 feet to 28 feet. We give an illustration (fig. 81) of the machine folded for travel.

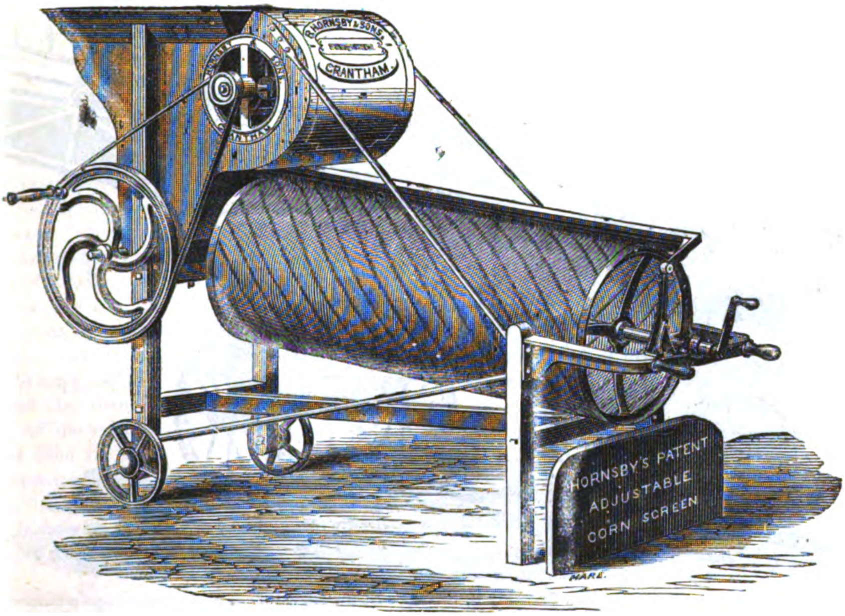


Fig. 80.—Messrs Hornsby & Sons' New Rotary Corn Screens.

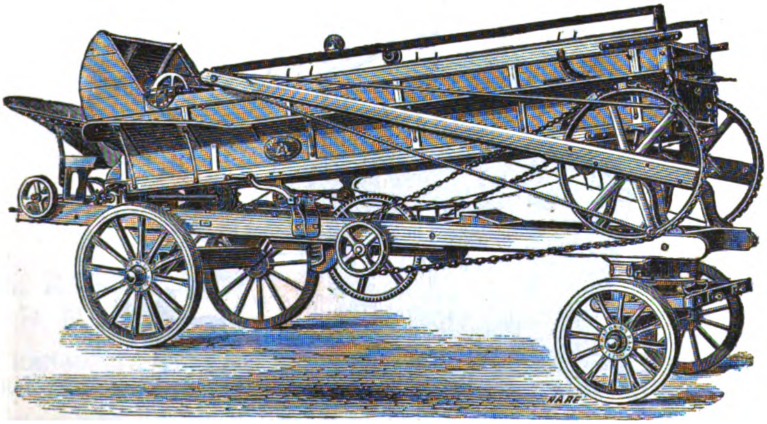


Fig. 81.—Messrs Marshall, Sons, & Co.'s Elevator Folded.

MR FREDERICK SAVAGE'S ELEVATOR.

The straw elevator of Mr Frederick Savage is compact, can be driven at any angle, and thoroughly prevents the straw from being blown away by the wind. (See fig. 82.)

MR YORATH'S PORTABLE HAY AND CORN ELEVATOR.

The old story is that "a penny saved is a penny gained," and Mr Yorath's elevator saves the penny and gains it. The arrangement manufactured by Mr Yorath, 2 Windsor Place, Cardiff, was much admired at the Royal Agricultural Society's Exhibition there. One important feature in the patent horse-fork elevator is that it is easy of erection. Three ordinary farm labourers can adjust the pole and pulleys in a quarter of an hour or thereby. By means of the elevator, a wagon-load of hay can be raised to the greatest height that it is desirable to construct hay stacks in from five to eight minutes, and it can easily keep half-a-dozen men pitching into the wagon in the field. Mr Yorath's elevator is not liable to breakage, and so easy of management that a careful boy can direct its operations and keep the stackers going. Those who have had its practical use for years are loud in its praise, which, from our own knowledge of it, we can fully appreciate.

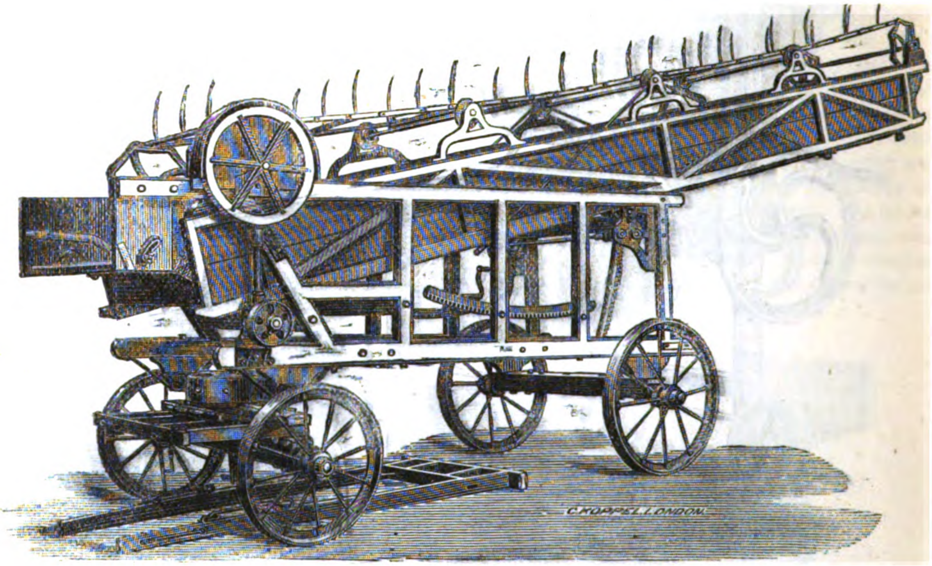

C.KOPPEL LONDON.

Fig. 82.—Mr F. Savage's Straw Elevator.

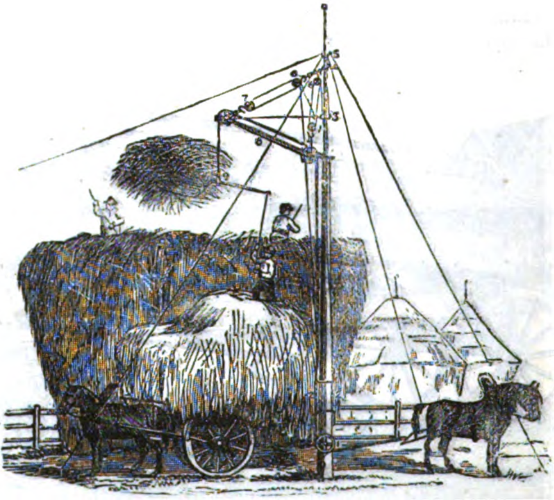


Fig. 83.—Mr Yorath's Portable Elevator for Stacking.

THE LOADER HARVESTING MACHINERY.

Messrs. Ruston, Proctor, & Co., Lincoln, are makers of Mr. Loader's new corn loading harvesting apparatus. The patentee has introduced a new corn loading and trailing harvest wagon. The complete apparatus accomplishes all that it was intended to do by the inventor, viz., economy of time and labour in collecting and securing harvest crops in the field. The machine is worked by a series of revolving rakes, which work within the circumference of the wheels, and lift their produce to any required elevation while the machine is travelling; the front rake lifts, and another enters at the hinder part of the wheels, gathering the crop as it lies spread, without the aid of manual labour, except to receive and place it on the load. The cradle at the side of the wagon is made to drop when unloading at the rick. Under the hands of a skilful person, something like 40 acres of corn per day can be secured by it. Loader's newly improved harvest wagon can be drawn from either end by the simple reversion of the shafts. When loading it trails with the harvester, and the shafts are raised and fastened to the eaves of the wagon at the rear; a coupling bar is attached from the harvester to a fore-carriage adjustable apparatus for drawing the trailing wheels; when full, the wagon shafts have merely to be lowered on to the horse's back and drawn away, being replaced by an empty wagon, and the load is carted to the rick.

MESSRS ROBEY & CO.'S STRAW ELEVATOR.

Messrs Robey & Co.'s Straw Elevator is a very efficient one. It is provided with a circular hopper, rendering it unnecessary to employ manual labour to carry the straw on to the elevator. With this improvement, the elevator can receive and deliver the straw from the machine at any angle. The straw is carried up inside the trough, and is therefore protected from being driven away by the wind. This elevator can be brought close up to the stack, upon which it will deliver the straw from a height of 18 to 25 feet. It is provided with Roper's patent driving arrangement, by which all gear is done away with, and thereby great wear and tear is avoided.

HORSE RAKES AND HAY-MAKERS.

MESSRS RANSOMES, SIMS, & HEAD'S HORSE RAKES AND HAYMAKERS.

Messrs Ransomes, Sims, and Head's "Star" horse rakes had the honour of taking the first prize at the Royal Agricultural Society of England's meeting at Manchester in 1869. Since that time, so much have the qualities of the machines been appreciated, that upwards of 25,000 have been sold since the date o their introduction. The advantages of these implements are that they have, from the large size and accurate form of the teeth, a great capacity for collecting a large load without twisting or matting the hay. The teeth are of steel of a T form, which reduces friction, gives strength with lightness, and insures clean raking. The wheels are of wrought iron, and capped to exclude dirt. They are high, and therefore easy of draught, and are furnished with side levers to raise or lower the frame, so that the points of the teeth can be adjusted so as just to skim the ground, and to prevent any dirt from being collected when raking corn, or set deeper when raking hay; while, by a segment on the shafts, they can be adjusted in an inclination more or less to the ground. The replacement of a tooth, when necessary, can easily be made by the man working the rake. Messrs Ransomes, Sims, & Head have recently brought out what they call a "toe and heel delivery," in which the action of the foot unlocks the rake and delivers the load without the assistance of the hand, leaving both hands free for the management of the horse, and the teeth can be raised whether the horse is going forward or not. This is a very simple arrangement, and is easily worked, even by a lad. In the engraving given, the usual hand lever is shewn removed from the rake, as it is not required when the "toe and heel" delivery is used, and the rake works better without it. The implement, as will be seen, is provided with a comfortable seat for the driver (fig. 84).

The "Universal" haymaker, manufactured by this firm, has overhead and backward actions, and a patent tine adjustment. The tines are not fixed in one position, but can be altered to suit forward and backward motions, and are adaptable to light and heavy crops. It teds the hay in an unexceptionable manner, and so leaves it that, under ordinary circumstances, it can speedily be stacked. In construction the machine is simple and strong, yet light, and the adjustments are easy and effective. The road wheels are of wrought iron, and 4 feet high. The main driving-wheel is a separate casting from the nave of the road wheel, and can be replaced in a few minutes at the smallest cost. We give an illustration (fig. 85).

MESSRS PICKSLEY, SIMS, & CO.'S HORSE RAKES.

Messrs Picksley, Sims, & Co. manufacture excellent horse rakes. These machines are all made of the best material, are of capital workmanship, and are characterized by lightness of draught, simplicity in their motions, which enables them to be wrought easily by any ordinary farm servant, and efficiency in work. The locking apparatus of Messrs Picksley, Sims, & Co., while keeping the teeth firmly down to their work, admits of their following completely any inequalities of the land. The travelling wheels are high, and made of wrought iron. One of the latest additions to their rakes is one fitted with a seat for the driver, which, by means of a screw wheel attached

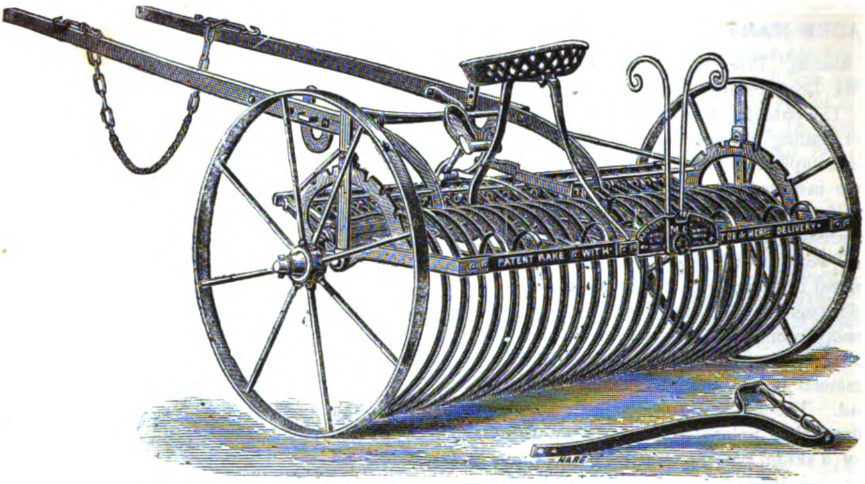


Fig. 84.—Messrs Ransome's "Star" Horse Rake "M.C."

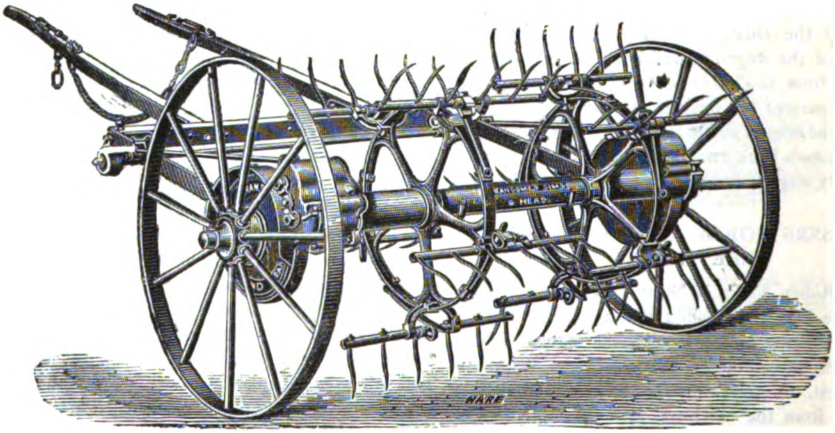


Fig. 85.—Messrs Ransome's "Universal" Haymaker.

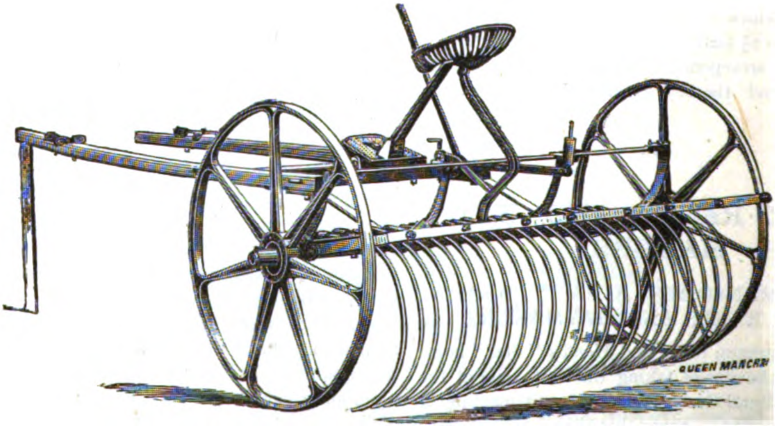


Fig. 86.—Messrs Picksley, Sims, & Co.'s Improved Horse Rake.

to the front support, can be adjusted so as to regulate the leverage to a nicety. The lever for raising the teeth is placed conveniently to the right hand of the driver. This rake can also be worked from behind, as a back lever is attached for the purpose. The teeth are of the best taper steel, insuring greater strength without adding to the weight. (Fig. 86.)

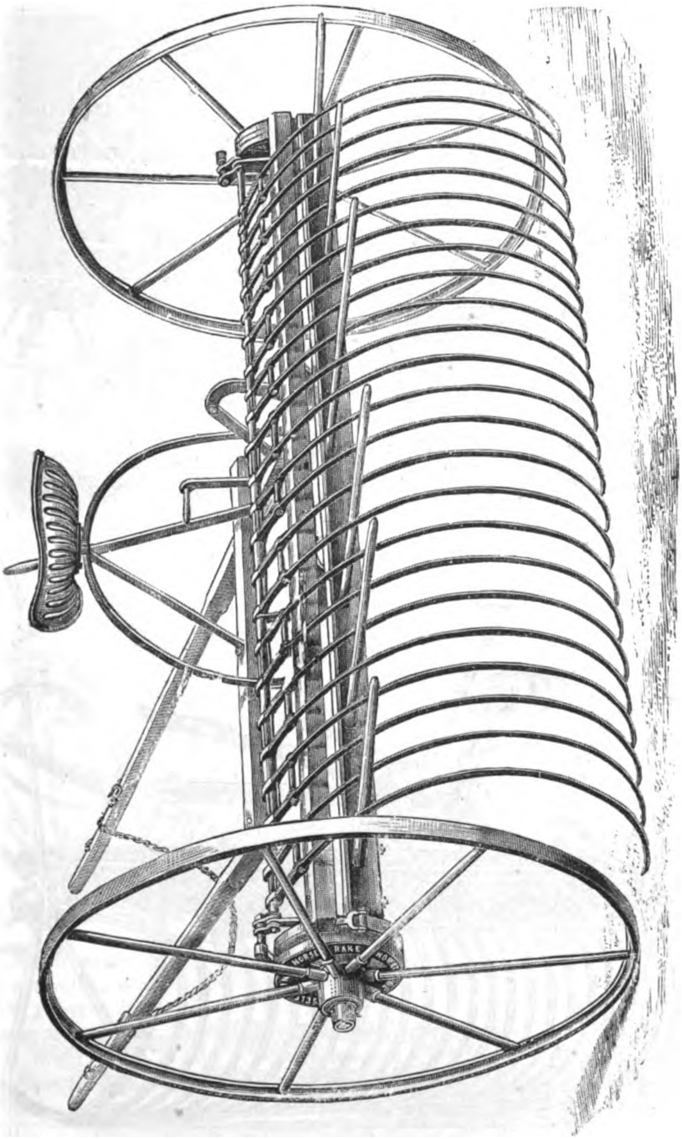


Fig. 87.—Messrs Howards' Anglo-American Rake.

MESSRS HOWARDS' ANGLO-AMERICAN RAKE.

The Messrs Howard have long held a foremost reputation for their horse-rakes, having devoted special attention to this particular department of farm implements, and all of their various makes are noteworthy for their simplicity of construction, lightness of draught, and durability. They have introduced an implement which they have named the Anglo-American horse-rake, which combines the lightness of the American rake (fig. 87) with far greater strength, and it is much more lasting in work. A simple and perfect brake principle is adopted for the lifting; a hand lever is also added as a convenient choice of means for lifting the teeth, which are made of fluted steel, tapered and tempered, and are so arranged that they can fall into hollows or furrows. The axles, which are of wrought iron, can be easily taken out for renewal when worn

This is an extremely simple, strong, and efficient implement.

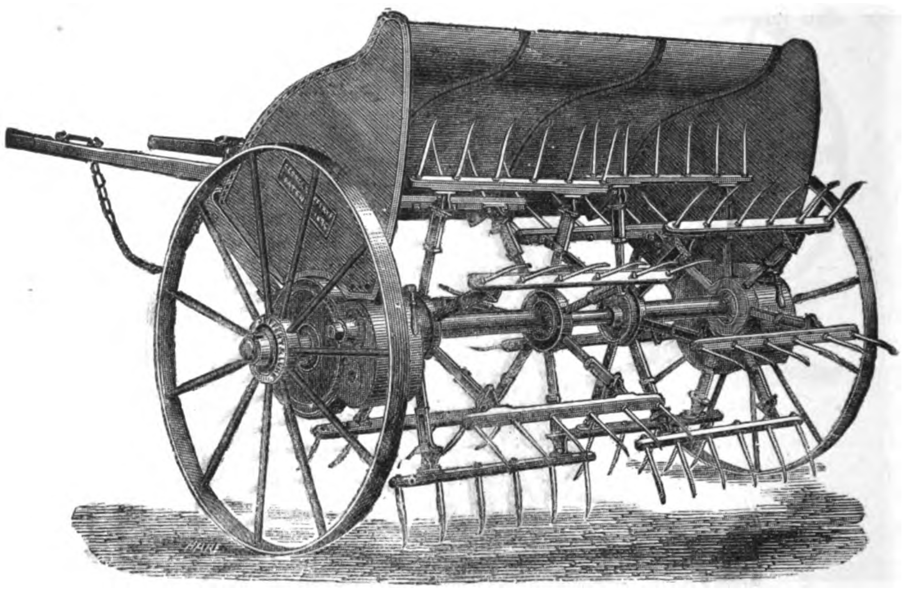


Fig. 88. Messrs Jeffery & Blackstone's Haymaker.

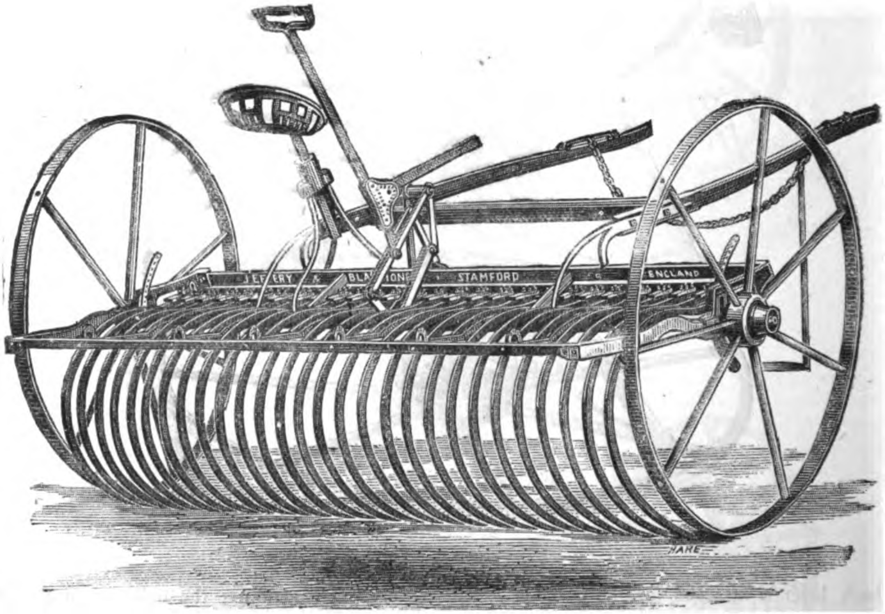


Fig. 89.—Messrs Jeffery & Blackstone's Horse Rake.

MESSRS JEFFERY & BLACKSTONE'S HORSE-RAKES AND HAYMAKERS.

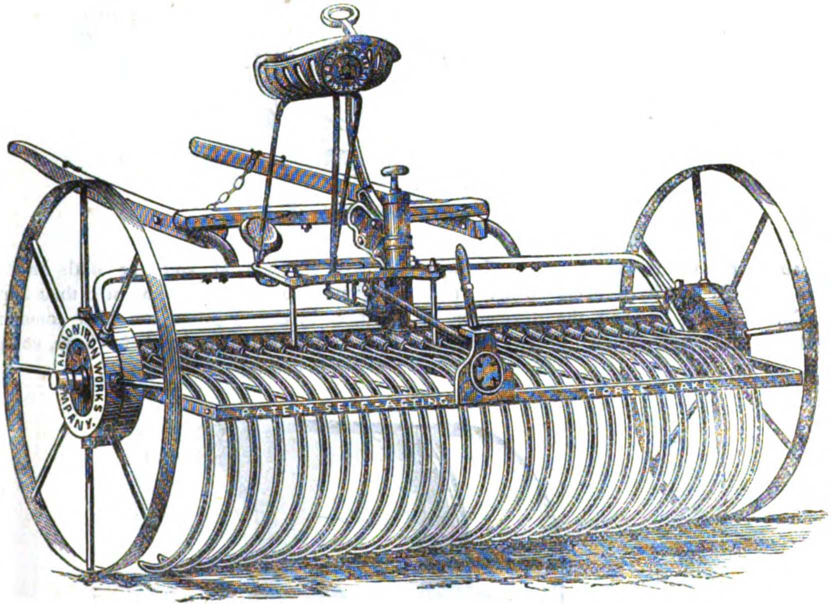
The characteristics of Messrs Jeffery & Blackstone's (Rutland Ironworks, Stamford) machines are their simplicity of construction, their strength and durability. Their haymaker is so extremely light in draught that it does not fatigue the horse at all—to use a common and expressive phrase, "does not even turn a hair on their coats." This machine can be readily taken down and cleaned, when necessary, by any farm labourer, the different pieces being so

nicely adjustable. The internal parts are thoroughly protected against hay seeds and dirt of any kind; the bearings are easily oiled. This haymaker teds out the heaviest crops without clogging, and leaves the crops evenly spread upon the ground through its very superior back-action. The manner of reversing the action, putting the machine out of gear, and of regulating the height of the forks, is very simple and effective; and altogether we highly commend the machine, which took first prize at the Royal of England at Taunton. We give an engraving (fig. 88).

We likewise notice Messrs Jeffery & Blackstone's new horse-rakes, which are strongly and compactly made, efficient in working, and not likely to get out of working order. They are unexcelled for the masterly manner in which they gather hay, corn, or stubble. The travelling wheels are of wrought iron, and are made 3 feet 6 inches, 4 feet, and 4 feet 6 inches diameter, as required. The teeth or tines are made of an improved section of steel, which has been proved to offer less resistance when filling or discharging than the ordinary pattern. They can be adjusted to rise or fall 6 or 7 inches to suit the inequalities of the ground; this enables them to rake perfectly clean on ridge or furrow. They also can be fixed any height for corn raking. The leverage for emptying is very simple, and easily worked by a youth, either riding or walking. They are also provided with a patent self-acting locking lever, which is a very important adjunct, as no horse rake will do its work thoroughly without it. They are, indeed, very perfect implements. (See fig. 89.)

THE ALBION IRONWORKS CO.'S HORSE RAKES.

The horse rakes manufactured by the Albion Ironworks Co. are remarkable for their lightness and strength. The double-headed section of steel teeth in the national horse rake, an invention of the Albion Ironworks Co., Rugeley Ironworks, Staffordshire, is a great improvement upon other tines, and is gradually being appreciated as such by the trade and by farmers. The arrangement for self-delivery, while ingenious, is very simple and easily put into operation, requiring only a pressure of 2 lb. to connect the pawl with the internal ratchet wheel—an arrangement which enables the rake to deliver its load without any apparent additional strain upon the horse. (Fig. 90.)



Fig, 90.—The Albion Ironworks Co.'s Self-Acting Horse Rake.

MESSRS J. G. ROLLINS & CO.'S HORSE RAKES.

The American Hollingsworth horse rake sent out by Messrs J. G. Rollins & Co., Old Swan Wharf, London Bridge, is remarkable for its lightness and substantiality, its non-liability to breakage, and its generally neat finish in all parts. This rake is fitted with adjustable compound spring teeth, each of which works independently of the others. As the upper end of the tooth plays upon a spiral spring, strain is prevented when the tooth is caught upon any obstruction; and the teeth, which are of strong steel tempered in oil, adjust themselves readily to their places. One great and good novelty in this machine is that, by virtue of the adjustability of the teeth, they can be readily adapted to every kind of work, which is an immense advantage. The rake is light in draught, not liable to get out of order, and so simple in construction, that a boy can easily work it. It has also the merit of being cheap. (See fig. 91.) This machine has had the distinction of the Highland and Agricultural Society's silver medal.

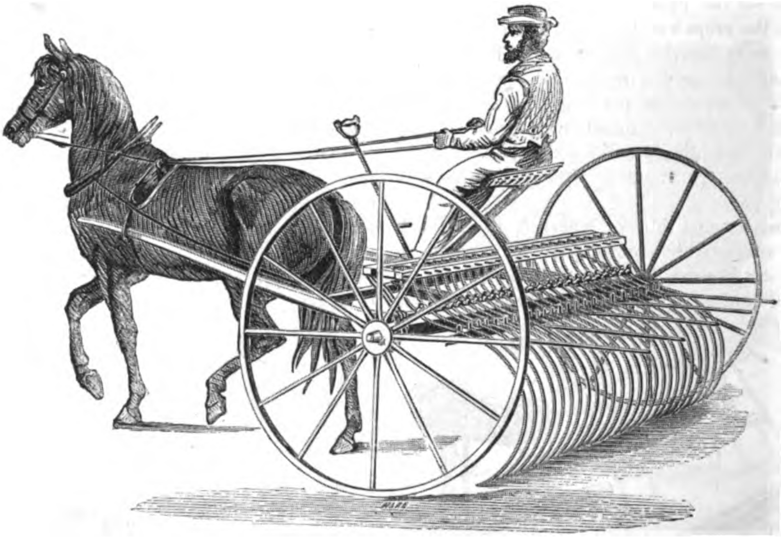


Fig. 91.—Messrs Rollins' Horse Rake.

MESSRS CARSON & TOONE'S TURNIP CUTTER.

Messrs Carson & Toone, Warminster, Wilts, have been very successful with their turnip cutters—the judges at various times, at the Royal Agricultural Society of England and the Bath and West of England Shows, having manifested their appreciation of them by money prizes and high commendations. It is easy to drive by hand, is cheap, compact, and efficient in cutting. (See fig. 92.)

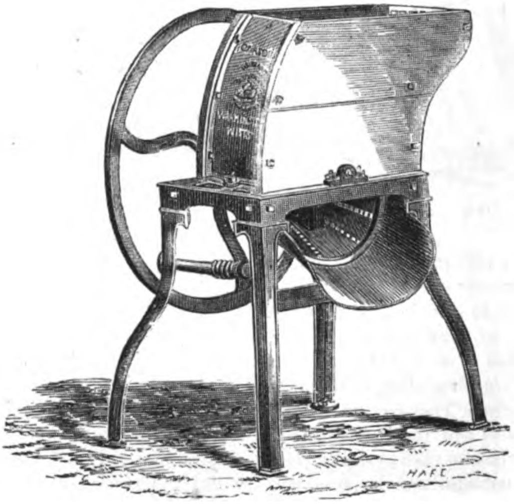


Fig. 92.—Messrs Carson & Toone's Turnip Cutter (Moody's Patent).

MESSRS RICHMOND & CHANDLER'S CHAFF-CUTTERS.

Messrs Richmond & Chandler's (Salford, Manchester) chaff-cutters have gained a name supreme in the class of food economizers. At the Oxford trials, under the auspices of the Royal Agricultural Society of England, it was reported by the judges in the *Journal*, "that such veterans as Messrs Richmond & Chandler have little to learn." "No doubt the bearings of their splendid machine (No. 66)," it is added, "were well oiled, and the knives brought to a razor pitch, but other makers were equally attentive to their interests, and none could produce similar results. Hence we must conclude that the method of gearing adopted by Messrs Richmond & Chandler must be economical." The jurors at the International Exhibition at Paris appear to have entertained the same views as the judges at Oxford, as they awarded the firm a silver medal for chaff-cutting machines. At the Manchester and Liverpool Agricultural Society, held at Liverpool, a silver medal was given to the firm "for superior workmanship, excellence of design, and adaptation of material." Messrs Richmond & Chandler have now fitted their machines with stop-motion, to be acted upon either by hand or foot, and likewise with a self-acting reverse motion. This reverse motion is not liable to clogging or breakage. It is so arranged that the roller and the web are both reversed instantaneously by one movement of a lever; therefore, as soon as the feed is run back, the web carries it away from the rollers, leaving them as cleanly, it may be said, as a new pin. If a very stupid attendant managed to get his hand into the rollers, the reverse action would free it before much harm was done. (Fig. 93.)

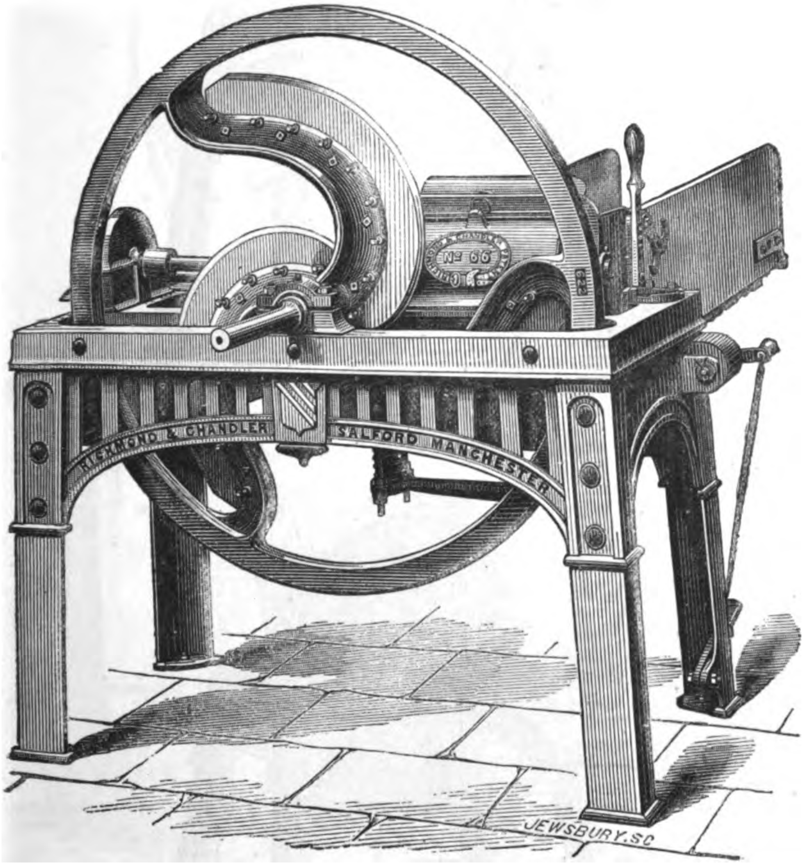


Fig. 93.—Messrs Richmond & Chandler's No. 66 Chaff-Cutter.

MESSRS RICHMOND & CHANDLER'S CORN CRUSHERS.

Messrs Richmond & Chandler have long devoted particular attention to the manufacture of mills for the crushing of all kinds of grain. The peculiar construction of these mills is, that they require no change of rollers in crushing any kind of grain or pulse; this, of course, being necessarily a great saving. The difference between the feeding with bruised oats, and the grain and hay in its natural state, was well tested by the London Omnibus Company some years ago. We are not aware that any such practical tests have been made since. The Company gave half of their 6000 horses whole oats and whole hay; they found that this system was unprofitable to the extent of £62, 10s. per day. Messrs Richmond & Chandler's corn bruiser saves 2½d. per day on each horse's head.

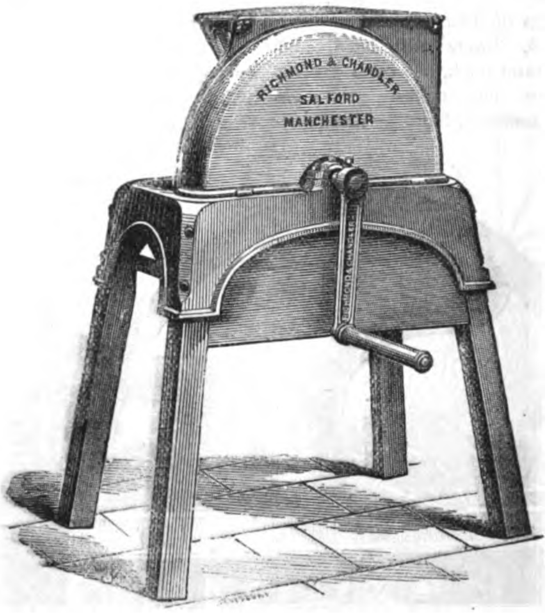


Fig. 94.—Messrs Richmond & Chandler's Root Pulper—Covered.

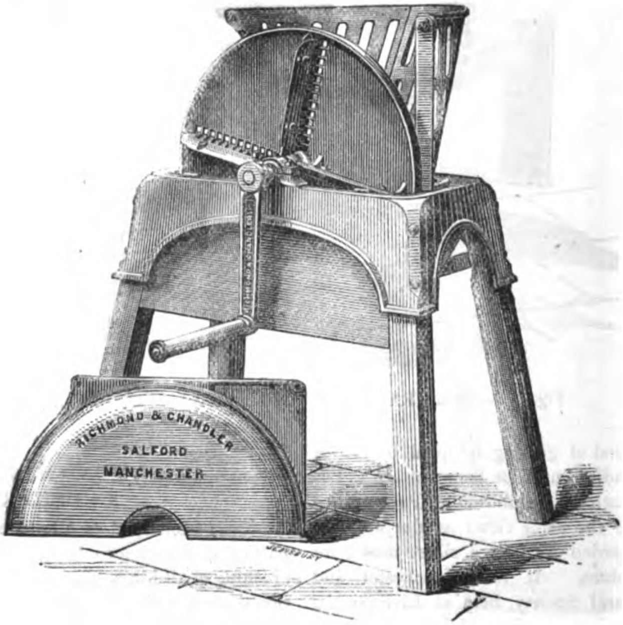


Fig. 95.—Messrs Richmond & Chandler's Root Pulper—Uncovered.

MESSRS RICHMOND & CHANDLER'S ROOT PULPERS.

It is many years ago since we found out by practical experience that a whole turnip given to a bullock was not by any means so economical as a chopped one. In more recent years we learned that even sliced turnips were not so profitable as pulped. Chopped hay and chopped straw are the best feed for cattle when these ingredients are mixed with turnips pulped. Messrs Richmond & Chandler have got the corn bruisers, the chaff-cutters, and the pulpers, and therefore have everything which stock-feeders desire. We give cuts of their new pulpers—one representing the pulper with cover on, the other with cover removed to shew the improved disc. (Figs. 94 and 95.)

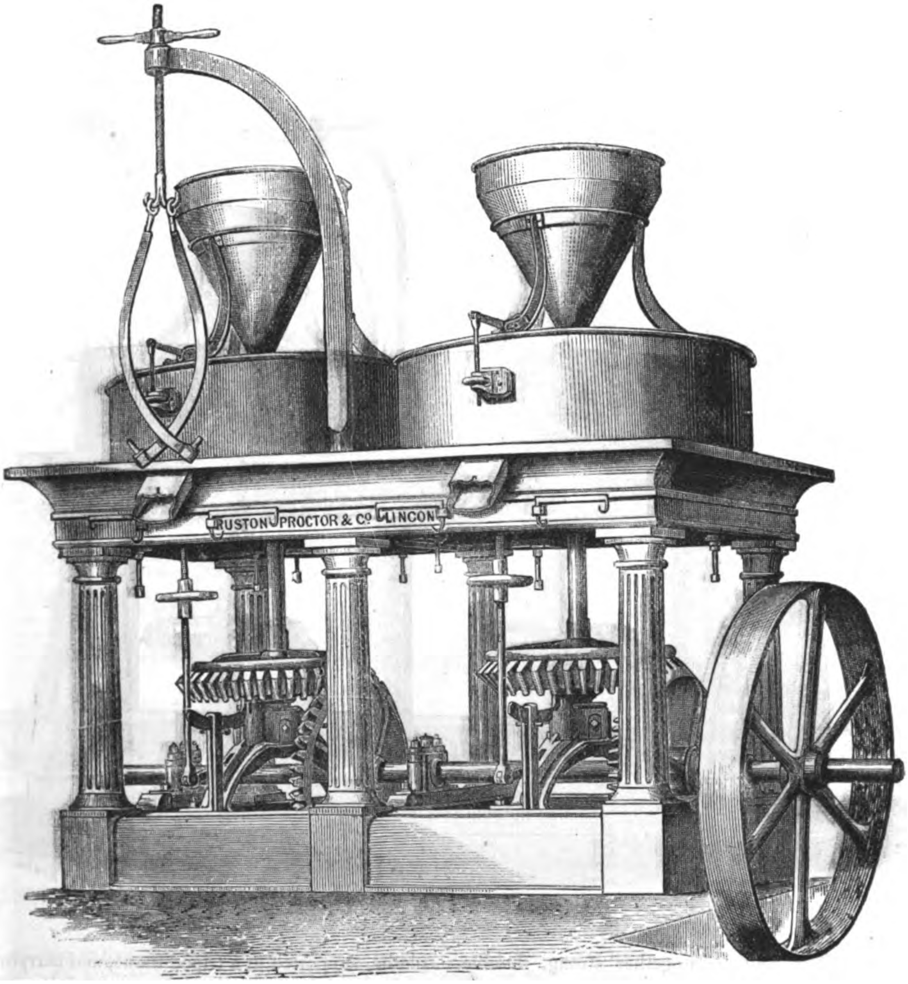


Fig. 96.—Messrs Ruston, Proctor, & Co.'s Combined Corn-Grinding Mill.

MESSRS RUSTON, PROCTOR, & CO.'S COMBINED CORN-GRINDING MILLS.

Messrs Ruston, Proctor, & Co., of Lincoln, are always up to the mark in everything they undertake. Their corn-grinding mills in all respects are excellent. They are good in design, the workmanship is of the best, and what the firm is always careful about is that each stone is actuated without any loss of power. The machine we illustrate (fig. 96) is specially adapted for exportation. It is fitted with two pairs of stones in one frame, but any number of stones, up to six, can be placed in a continuous frame, which is exclusively of iron, very strong, and may be driven by one lay shaft, thus dispensing with the usual expensive overhead motion, pulleys, strapping, &c. Each pair of stones is fitted precisely in the same manner as the single mills, and every modern appliance is introduced to insure their successful working: a lever is fitted to each pair, so that any pair or pairs may be thrown out of gear at pleasure.

Messrs Ruston, Proctor, & Co.'s flour-dressing machine is decidedly one of the best in the market.

MESSRS ROBEY & CO.'S FIXED CORN MILL.

This is a very superior Corn Mill, fitted with two pairs of stones, the whole of the machinery being contained within a cast-iron frame, which can be readily erected. The French stones are of excellent quality, and will grind the finest of flour. The feed and stones are provided with apparatus for adjusting them to the greatest nicety; of polished wrought-iron are the mill spindles and shafts, and one of each pair of stones is geared with wood to obviate noise and vibration. The mill is altogether strong, durable, and efficient. (Fig. 97.)

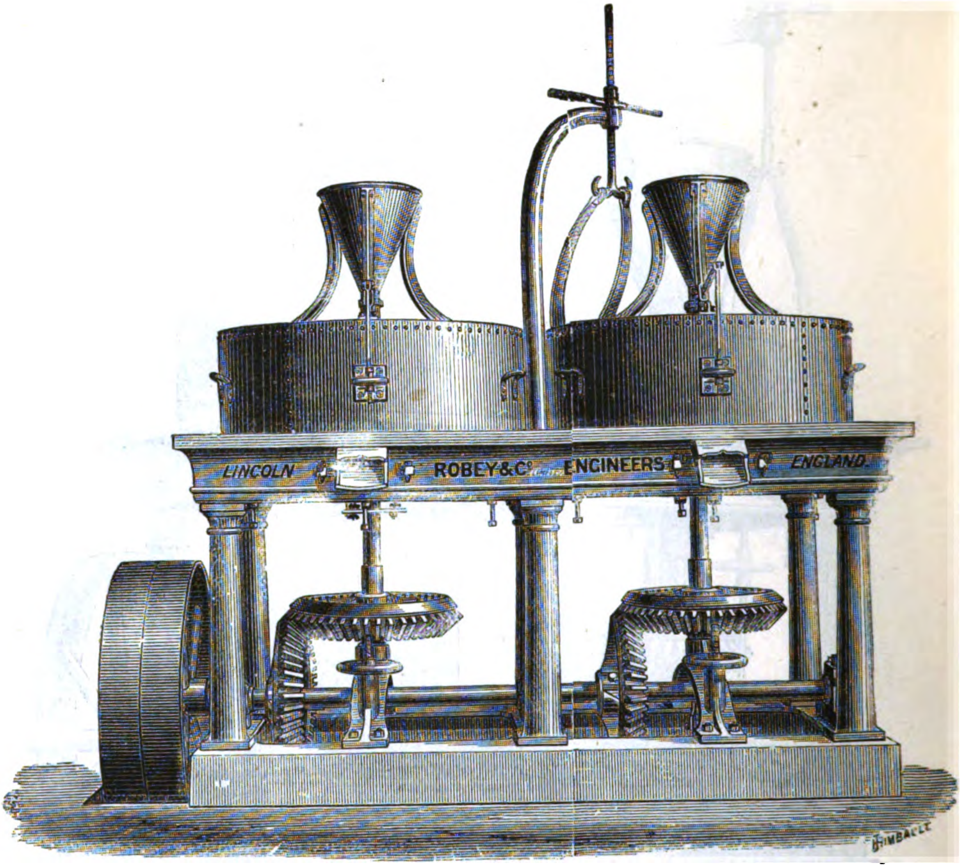


Fig. 97.—Messrs Robey's Fixed Corn Mill.

Messrs Robey also manufacture, for the wants of small occupiers, a Portable Mill, all complete within itself, and mounted upon strong wheels. It can travel from place to place in the same manner as a portable engine and thrashing machine.

Messrs Robey's Self-Acting Circular Saw Benches are very great adjuncts upon many farms where sawing of wood is necessary.

MESSRS W. N. NICHOLSON & SON'S GRIST MILLS.

About the excellence of Messrs Nicholson & Son's (Newark-on-Trent) manufactures generally it is almost needless to speak. The material is good to start with, and the way in which it is manipulated into the various articles necessary for the farm which the firm supplies shews careful workmanship. At the Royal Agricultural Society of England, Messrs Nicholson & Son gained a silver medal for their patent grist mill, which did its work uncommonly well. This mill may thus shortly be described:—On the top of a vertical spindle, supported in a tripod frame, and carrying the driving pulley, is loosely fitted a metal bell or cone. This constitutes the grinding part. Its surface is deeply grooved at the top for kibbling purposes, and finely lined at the bottom for grinding into flour. It revolves inside a concave similarly grooved, but cut the reverse way. The position of the cone with the concave is altered by means of a hand-wheel and levers, which raise or depress it at will, and adjust it for grinding fine or kibbling, with the peculiarity of allowing the grinding surfaces to remain idle when kibbling only is required. A safety provision is made for allowing the passage of any foreign hard substance, such as a nail or stone introduced with the feed, without injury to the grinding parts. The feed is reguated by means of a ferrule fixed at the bottom of the hopper, and riding on the crown of the cone. This can be readily set to a nicety by a simple combination of catch and screw. We cannot say more in favour of this grist mill than was said of it by the judges at the Liverpool Show of the Royal Agricultural Society of England, which in effect was that the wear and tear of the machine was greatly reduced by having the grinding and the kibbling actions dissevered. The mill can grind linseed as well as corn. (Fig. 98.)

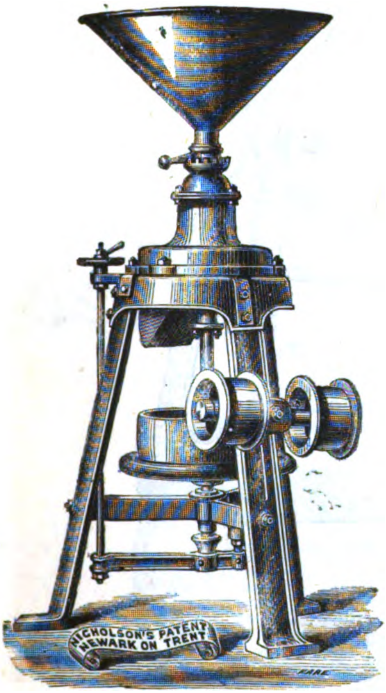


Fig. 98.—Messrs Nicholson's Safety Grist Mill.

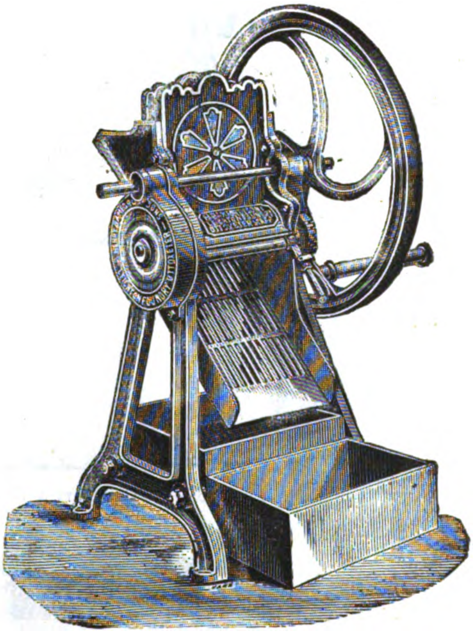


Fig. 99. —Messrs Bamford's Oil-Cake Mill.

MESSRS HENRY BAMFORD & SONS' OIL-CAKE MILL.

The oil-cake mill of Messrs Henry Bamford & Sons, Uttoxeter, Staffordshire, which we illustrate (fig. 99) is easily driven, and quickly breaks eight sizes of cake, suitable either for sheep or for cattle. It is inexpensive in cost and durable in wear.

MESSRS JEFFERY & BLACKSTONE'S (LATE ASHBY & JEFFERY) CHAFF-CUTTERS.

The change in the name of this firm has in no way detracted from the meritoriousness of the manufactures produced at the Rutland Ironworks, Stamford. Under the designation of Messrs Ashby & Jeffery, the fame of the articles sent out by the firm spread abroad into all parts of the United Kingdom and to the Continent. Under the new *regime*, the trade is being rapidly extended in all directions, and the increase in business is not to be wondered at, as the materials used in the construction of all their implements and machines are the very best procurable, and the workmanship is equal in excellence to the raw material. The chaff-cutters turned out by Messrs Jeffery & Blackstone are remarkable for their strength, durability, and lightness. Their wrought iron frame machines on wrought angle-iron legs are remarkable for their simplicity, cheapness, and, of course, power of resisting strain. These are points which Messrs Jeffery & Blackstone make features in all their machines. For cutting hay, straw, roots, or furze, nothing can excel them. The head and frame are not made in one casting, as many are, but in separate parts, so that in case of accident the part can be repaired at very small cost, whereas, if the cast-iron machine breaks, an entire new head is required. The cog-wheels are all covered up to keep the dirt out, and to prevent incautious persons from getting their fingers crushed. Messrs Jeffery & Blackstone's No. A chaff-cutter is a grand machine and a cheap one, easy of working, and not liable to get out of order. It is thoroughly well made in all its parts, and can readily be repaired if any untoward accident should unfortunately accrue to any of the parts. We illustrate this machine (fig. 100), which cuts two lengths without change of wheels by merely sliding one wheel into another. It has a rising mouth 8¼ inches wide, cuts a beautiful sample of ¼-inch chaff for horses, and ⅜-inch for cows; it cuts a large quantity in a short space of time, and it works so easily that a boy can manage it. This machine is not liable to choke or break. It has no

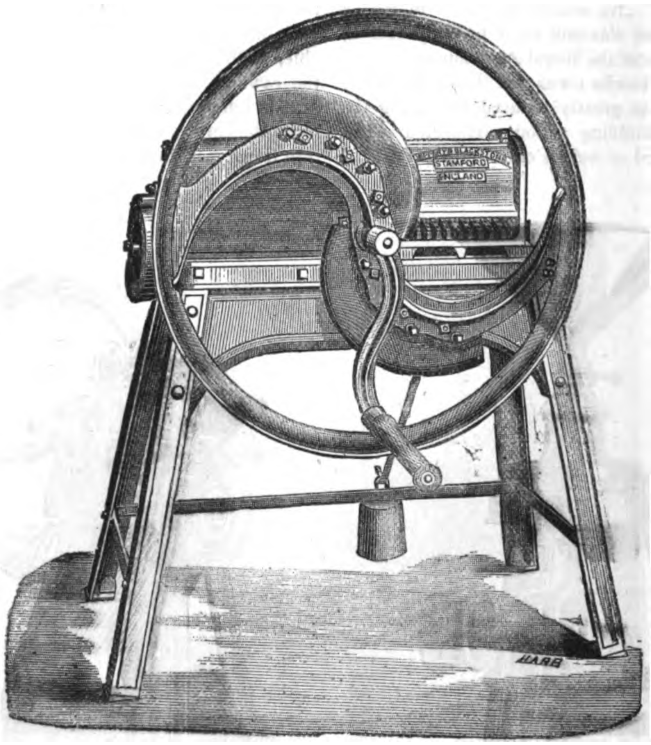


Fig. 100.—Messrs Jeffery & Blackstone's Chaff-Cutter.

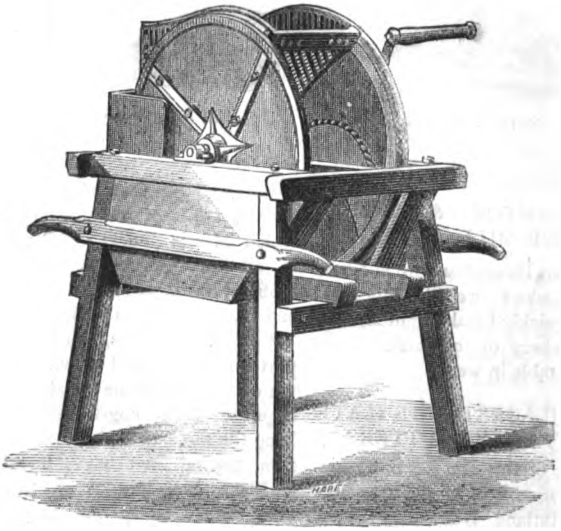


Fig. 101.—Messrs Vipan & Headly's Root Pulper and Slicer.

worm gearing, and the cog-wheels are all made extra strong, and boxed up to prevent accidents and keep out the dirt, &c. It is, like the others, admirably adapted for cutting cultivated furze.

This firm also manufacture chaff-cutters of stronger character, and for horse and steam power. The merits of these chaff-cutters, besides being recognized as first-class at agricultural gatherings at home, have received many tokens of the respect in which they are deservedly held by foreign agriculturists in the shape of gold and silver medals.

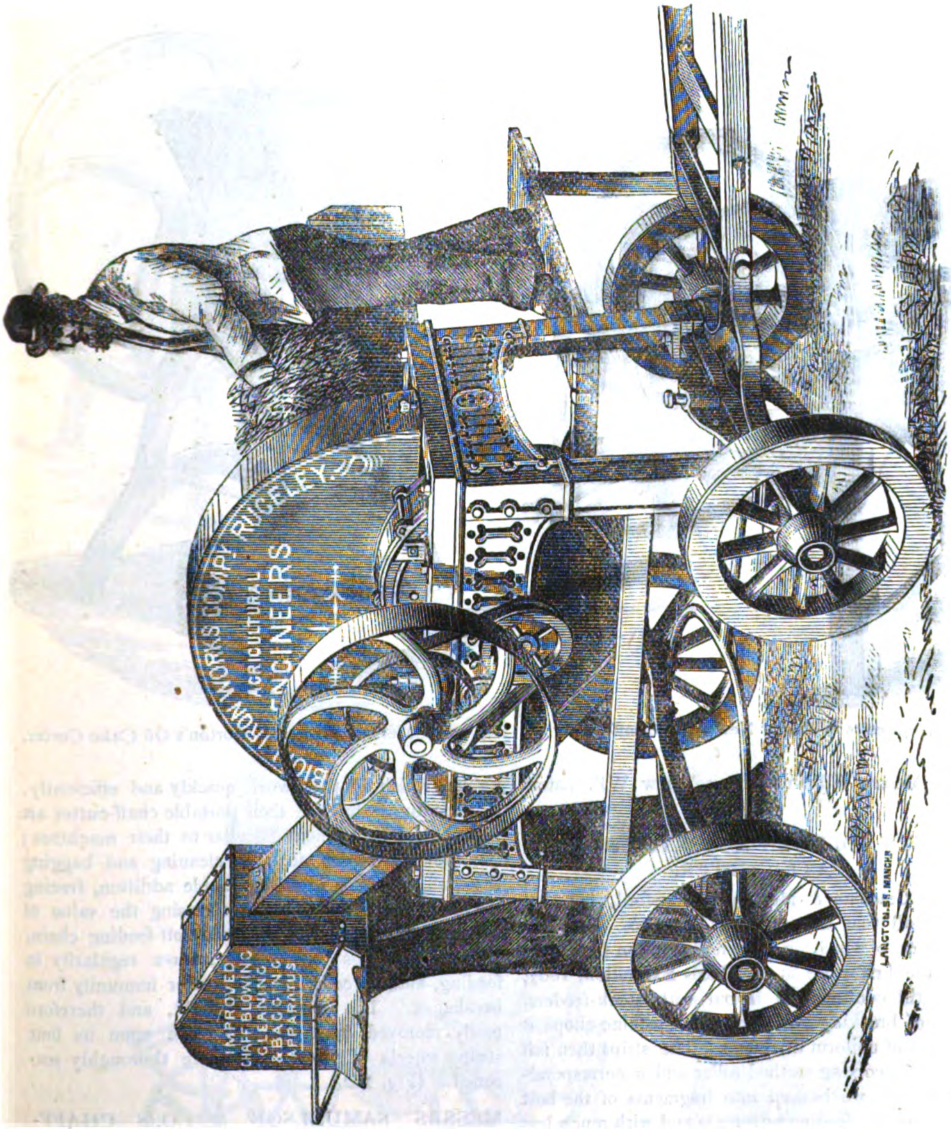

ALBION IRON WORKS COMPY RUGELEY
AGRICULTURAL ENGINEERS
IMPROVED CHAFF BLOWING CLEANING & BAGGING APPARATUS
LANGTON.SC.MANCHR

Fig. 102.—Albion Ironworks Co.'s Portable Chaff-Cutter.

MESSRS VIPAN & HEADLY'S COMBINED SLICER, PULPER, &c.

The combined machine manufactured by Messrs Vipan & Headly has two discs, reversible hopper, and handles to move from place to place, and is adapted either for cutting, pulping, or stripping. It is adapted for power as well as manual labour. (See fig. 101.)

MESSRS WILLIAMS' CHAFF-CUTTERS.

Messrs John Williams & Sons, Rhuddlan, near Rhyl, make good chaff-cutters. They are easy to drive, having less gearing about them than many other machines constructed for the same purpose. They are mounted on circular wrought-iron legs, with arch plates well braced together. They cut two lengths of straw without change of wheels, have stop and reverse motions on the fly-wheel shaft, and patent feed-rolls to prevent them from choking under any circumstances. The fly-wheel is fitted inside the frame, and in brass bearings the main shaft works, thus avoiding considerable wear and tear. We give an engraving (fig. 103) of Messrs Williams & Sons' new WP. patent machine.

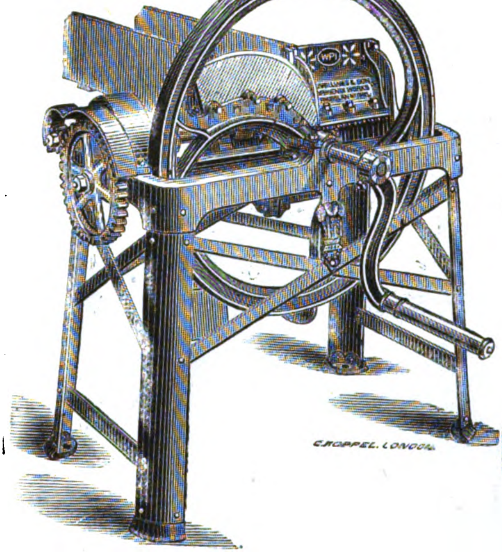


Fig. 103.—Messrs Williams' New W.P. Chaff-Cutter.

MESSRS COLEMAN & MORTON'S OIL-CAKE CUTTER.

Messrs Coleman & Morton, Chelmsford, manufacture well all that they put their hands to. This oil-cake cutter, of which we give an illustration (fig. 104), gained the first prize at the Paris Exhibition, 1867, and it still continues in favour with stock-feeders. Instead of breaking the cake, this machine chops it into strips of uniform thickness. The strips then fall between a revolving toothed roller and a corresponding back, and are broken into fragments of the best possible size for feeding purposes, and with much less dust than is ordinarily made. To alter the size of sample, no separate back is required; but by simply turning the small hand-wheel, the machine may be instantaneously set to cut, from the smallest size for sheep and lambs, to the largest for bullocks.

THE ALBION IRONWORKS CO.'S PORTABLE CHAFF-CUTTER.

The Albion Ironworks Co.'s (Rugeley, Staffordshire) portable chaff-cutter, with improved blowing, elevating, and bagging apparatus, is of much value. This machine, which is of great strength, is capable of cutting 20 to 25 cwt. of chaff per hour. The cutter, it may be mentioned, is made with the knives, which do their work quickly and efficiently. The leading features in their portable chaff-cutter are—the steel mouthpiece peculiar to their machines; the blowing arrangement for cleaning and bagging the chaff, which is a most valuable addition, freeing the chaff from all dust, and increasing the value of even inferior hay; the registered self-feeding chain, which diminishes the labour, insures regularity in feeding, and, in consequence, greater immunity from breakages. The machine is light, and therefore easily-removed from place to place upon its four strong wheels of wood, which are thoroughly seasoned. (Fig. 102.)

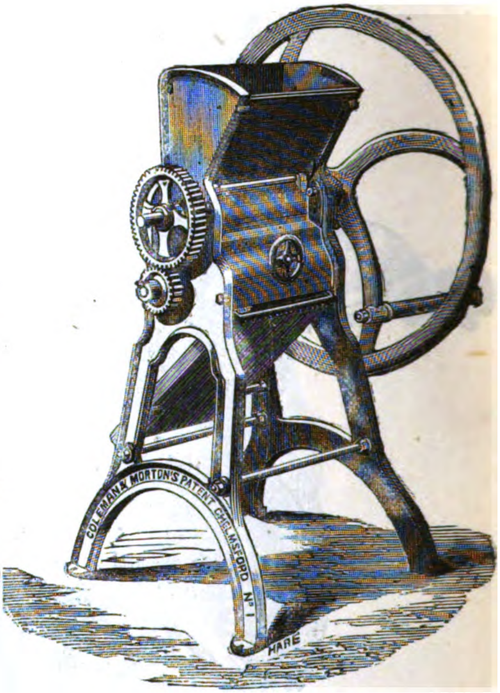


Fig. 104.—Messrs Coleman & Mortŏn's Oil Cake Cutter.

MESSRS SAMUELSON & CO.'S CHAFF-CUTTERS, TURNIP-CUTTERS, &c.

Messrs Samuelson & Co., Banbury, have long been noted for the excellence of their manufacture of chaff-cutters, root-pulpers, turnip-cutters, &c. The great object of the firm is to make these machines light and strong in frame, sharp in knives, clever in disc, and durable and efficient in working, and at the same time to make them cheap. This machine, independent of many other excellent qualifications, is also

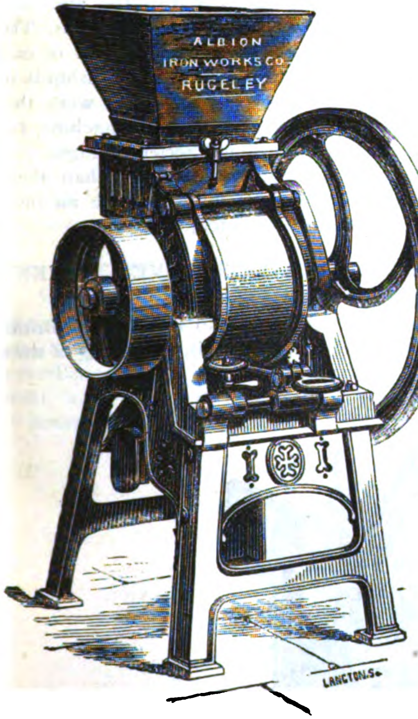


Fig. 105.—Albion Ironworks Co.'s British Grist Mill.

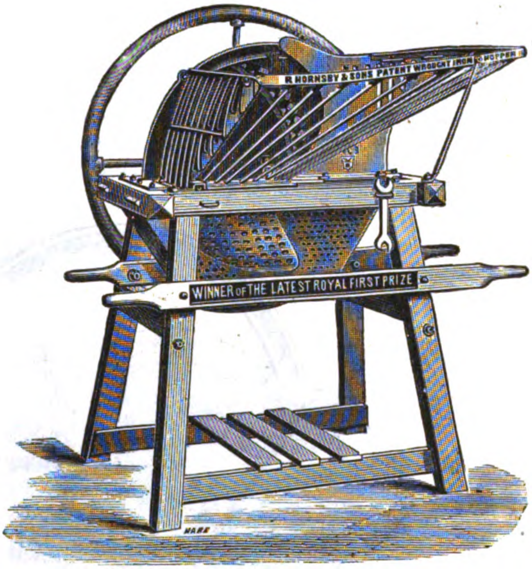

R. HORNSBY & SONS PATENT WROUGHT IRON HOPPER
WINNER OF THE LATEST ROYAL FIRST PRIZE
HARE

Fig. 106.—Messrs Hornsby's Turnip-Cutter.

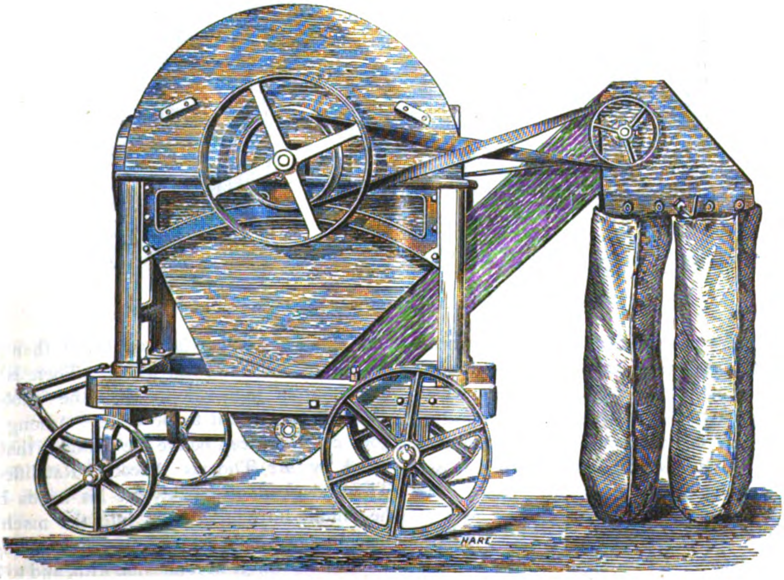


Fig. 107.—Mr Allcock's New Patent Safety Lever Portable Chaff-Cutter.

easy to drive, and is fitted with iron drop handles to facilitate its removal from place to place.

THE ALBION IRONWORKS CO.'S GRIST MILLS.

The Albion Ironworks Co., Rugeley, Staffordshire, hold a high reputation as agricultural engineers. The Company's works are in the heart of a district where the best of iron can be procured at a less cost of carriage, and accordingly they have the advantage over most other firms in this respect, which advantage they freely bestow upon their customers. The design of their machines is simple, and their construction throughout shews very perfect workmanship. Their British grist mills have improved grinding surfaces, made of a special mixture of metal cast on chills, rendering them very durable. The surfaces are capable of the most minute and accurate adjustment, making the grist to any sample required. The surface can speedily be re-sharpened by a simple process of running a little fine sand or emery with oil through the mill. One great feature in the grist mill, which we illustrate (fig. 105), is that by a new and effectual arrangement pieces of iron pass through the mill without injuring it in the slightest degree. It is a simple and cheap machine.

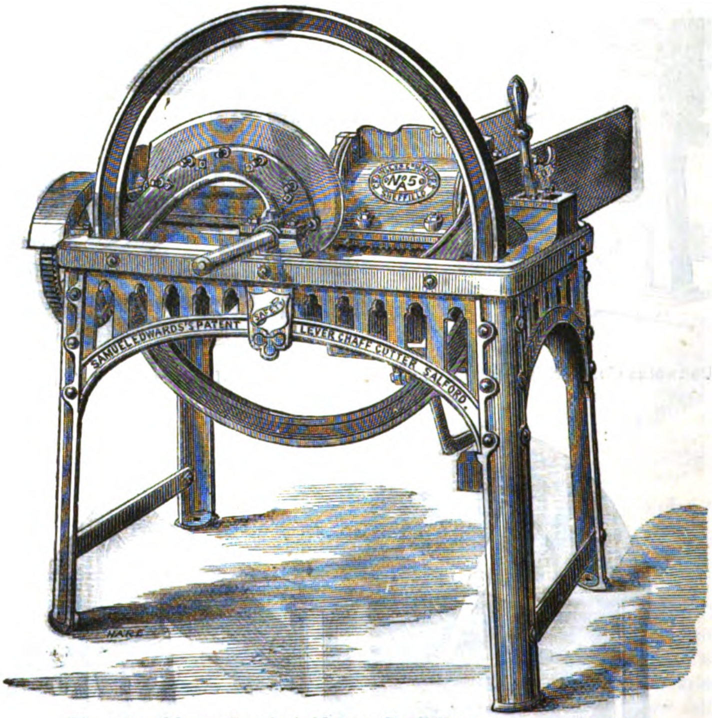


Fig. 108.—Messrs Crowley's No. 5A Chaff-Cutter (Edwards' Patent).

MESSRS HORNSBY & SONS' ROOT-CUTTER AND SLICER.

Messrs Hornsby & Sons have gained a reputation for their root pulpers and their cutters, inasmuch as they are light of working, and there is no loss in the cutting, no broken pieces to tell a tale of bad manipulation. They have wrought-iron hoppers; they feed continuously without requiring aid from the attendant after the material has been put into the hoppers. The use of wrought iron in the hoppers instead of cast iron is a decided advantage. The workmanship is in every detail good. The pulper does its work thoroughly. The roots pulped by this machine, (as tested by the Royal Agricultural Society's judges,) preserve the juice and the flavour longer than those pulped by any other machines. We give an illustration of the disc slicer (fig. 106).

MR ALLCOCK'S SAFETY LEVER PATENT CHAFF-CUTTER.

It has taken a long time to instruct the British farmers that chaff-cutting—that is, the cutting of straw into small particles—is much better than to allow th stock to munch the straw whole. There is waste, and danger from indigestion, when the whole straw is given as it was wont to be done. Among the many good cutters placed before the public is that manufactured by Mr Thomas Allcock, Ratcliffe-on-Trent. The feeder cannot possibly get his hands hurt unles he wilfully introduces them into the machine. The machine, of which we give an engraving (fig. 107), is intended to travel in connexion with, and to be worked by, a portable engine. It is fitted with the most improved feed-rollers, and, having two sets, cannot possibly choke. It will cut ⅜-inch chaff, screen out the dust, and bag the chaff, at the rate of 2 tons per hour; and ¼-inch chaff, 3½ tons per hour. The lengths can be altered as the machine is working. It is mounted on four strong wheels; the mouth is of steel, 14 inches wide, rising from 2 inches to 5 inches, with three knives; has reverse and stop motion and brass bearings; and is made with either concave or convex knives. All the works are boxed in, so that it will cut in any weather. No doubt it will prove a profitable addition to farm mechanical appliances.

Mr Allcock likewise manufactures chaff-cutters of the ordinary kind, where the working is easily seen.

MESSRS JOHN CROWLEY & CO.'S CHAFF-CUTTERS (EDWARDS' PATENT).

Messrs John Crowley & Co., Meadow Hall Ironworks, near Sheffield, have long been celebrated for the excellence of their chaff-cutters (Samuel Edwards' patent), and last year they were distinguished by the jurors at the Grand International Exhibition of Paris, who awarded them the gold medal. To speak generally of the chaff-cutters manufactured by this firm, the mechanical arrangements are simple and efficient, the whole of the working parts—*i.e.*, starting, reversing the rollers, and varying the length of cut—being entirely under the control of the starting lever, which is a great advantage, and part of the patent. The machines can be made to cut from ⅛ inch upwards, and in all cases perfect safety is secured to the attendant feeding. The chaff-cutters can also be fitted with a travelling web or feeding apparatus inside the hopper, the action of which web is also entirely under the control of a lever, which stops, reverses, and varies the length of cut, so that the feed-web is reversed or stopped, and the speed varied by this same lever, which stops, reverses, and changes the length of cut. All the chaff-cutters are fitted with hardened steel mouthpieces, which keep the knives always in good cutting order. The No. 5A machine (fig. 108) is adapted for both hand and horse power. It is fitted with Crowley's patent carburetted mallable-iron legs, which prevents breakage in transit, and this iron, so worked up, is as rigid as any cast. The vibration often noticeable in chaff-cutting machines upon wrought-iron legs when driven by power, is obviated by the use of the carburetted mallable iron. No. 5A has solid cast-iron feed-rollers, steel mouth-piece, &c., like the others mentioned above.

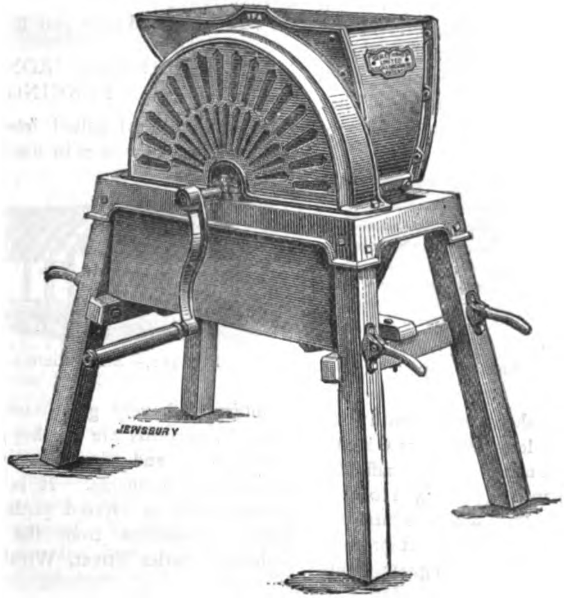


Fig. 109.—Messrs Picksley, Sims, & Co.'s Root Pulper.

MESSRS PICKSLEY, SIMS, & CO.'S CHAFF-CUTTERS.

Messrs Picksley, Sims, & Co.'s chaff-cutters, turnip-cutters, grist-mills, and general food-preparing machines, are well known as being excellent in construction and efficient in working. We notice they have been deservedly successful in obtaining all the principal honours at the great trials of food-preparing machines held by the Dutch National Agricultural Society at Delft, Holland. The following prizes have been awarded to their machines:—First prize for horse power chaff-cutter; first prize for hand power chaff-cutter; first prize for root pulper; first prize for grist-mill for power; second prize for oat and bean mill for hand power. We give an engraving (fig 109) of the first prize root pulper.

MISCELLANEOUS.

MESSRS BAYLISS, JONES, & BAYLISS' TUBULAR FENCING.

Messrs Bayliss, Jones, & Bayliss, Victoria Works, Wolverhampton, and of 3 Crooked Lane, London, manufacture tubular fencing of great strength, lightness, and cheapness. This tubular fencing is so constructed that few keys or wedges are required, yet the standards cannot move out of their position. This satisfactory result is accomplished by the second tube from the top being made in lengths, which fit exactly to the sides of the uprights, with a smaller piece of iron welded in one end of each length, running through the upright into the length on the other side, and to which it is riveted, so that each standard is kept firmly in its place. The other tubes are in long lengths, and connected in the joining standards in a similar manner, but not riveted. This fencing is well adapted for export on account of its lightness, its compactness, and the ease with which it can be fixed by any ordinary labourer. Messrs Bayliss, Jones, & Bayliss have some excellent sheep-folding hurdles, which we can well recommend to farmers, as being very strong and durable. They will repay themselves in a short space of time. We give an illustration of one of these sheep hurdles with lamb creep. The hurdle is 12 feet long and 3 feet 6 inches high, and four of them, at the most, are quite sufficient in a fold. They are very handy. (See fig. 110.)

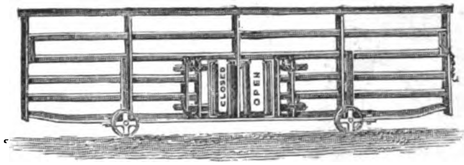


Fig. 110.—Messrs Bayliss, Jones, & Bayliss's Sheep-Folding Hurdle with Lamb-creep.

The patent continuous fencing, with the turn-over top, is an advantageous arrangement, as it prevents horses or cows from getting too near to gnaw shrubberies or garden trees. Messrs Bayliss, Jones, & Bayliss have recently introduced cast-iron earth plates in their patent continuous bar fencing, instead of the usual pronged feet. These plates are put a little below the ground line, the turf being removed previous to their introduction. Being so placed, the standards are driven through them about 18 inches into the ground, and wedged to the plate. These plates thoroughly prevent the standards from injuring the ground, and fix them as irrevocably in their places as the law of the Medes and Persians, until such time as they are required to be removed. The standards are made of tree iron, which is an improvement in appearance as well as in added strength. The fence, it may be added, is readily erected by unskilled workmen, who, by this method, are saved the labour of digging holes. We give a cut (fig. 111) of this continuous fencing adapted for cattle and sheep, shewing the position of the standards and the earth plates. The fencing stands 3 feet 4 inches above the ground, and has five bars. This fencing, it need scarcely be said, is constructed of different strengths and heights, according as it is intended for horses and heavy oxen.

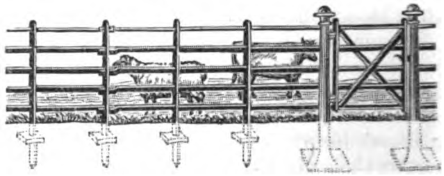


Fig. 111.—Messrs Bayliss, Jones, & Bayliss's Continuous Fencing for Cattle and Sheep.

The deer fencing manufactured by this firm is strong, portable, and cheap, and the latter commendable adjective, in these dear times, applies to all Messrs Bayliss, Jones, & Bayliss' fencing. Their field gates are substantial and their park gates ornamental.

MR S. SOTHERN'S IRON ROOFING AND FENCING.

Mr Sothern's galvanized iron, for roofs of farm buildings, has now been in use for the last quarter of a century with very great success. Iron roofs for covered farmyards are weather-proof, fire-proof, and vermin-proof, and wherever used have proved very profitable investments. It is acknowledged that manure made in covered yards is superior to that without protection from the weather. Mr. S. Sothern, Charles Street, Wrexham, has introduced simple methods of constructing these roofs, combining neatness in appearance with great strength, and due attention to proper ventilation. They can be formed self-supporting up to 50 feet span, but the spans most generally in use are from 18 to 20 feet.

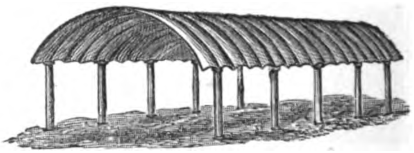


Fig. 112.—Mr Sothern's Iron Roofing.

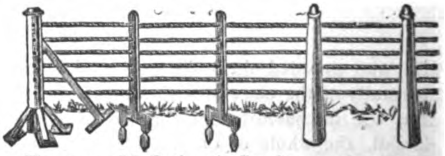


Fig. 113.—Mr Sothern's Continuous Fencing.

Mr Sothern's iron hurdles, continuous iron bar fencing, strained wire fencing, with solid wire or cable stand, in connexion with his galvanized tubular standards, form very neat and substantial fences; so also do his angle-iron standards.

MR W. BRENTON'S GALVANIZED STACK ROOFING.

The corrugated galvanized iron roofing manufactured by **Mr W. Brenton**, St Germans, Cornwall, is light and inexpensive. When hay or corn is taken from the field in good order, frequently deluges of rain come down before the cleverest thatcher can in the ordinary way properly secure it from the evil effects that necessarily follow upon a downpour. In a trice, with Mr W. Brenton's iron roofing, acres of ground can be covered with a waterproofing. The material is lasting; with ordinary care it will not wear out in a quarter of a century. A rick 20 feet by 14 feet can be covered in two hours. (See fig. 114.)

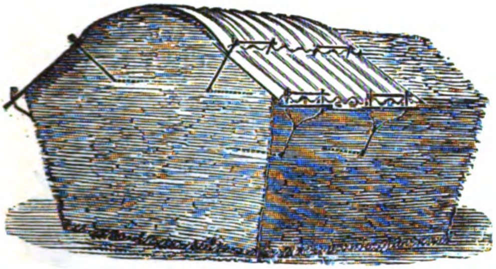


Fig. 114.—Mr Brenton's Galvanized Stack Roofing.

MESSRS A. & J. MAIN'S CONTINUOUS BAR FENCING.

Messrs A. & J. Main, Possil Park, Glasgow, and of 108 Queen Victoria Street, London, produce remarkably excellent continuous bar fencing, adapted alike for horses, cattle, sheep, or deer. This fencing is easily erected and removed; and it has two great merits besides—it is cheap and durable. By Main's patent stapling arrangement, the horizontal bars and the standards are securely joined. In this way the horizontal bars are prepared with oblong holes at the points where they are intersected by the standards or uprights. When the fence is erected, the free ends of these holes are found upon each side of each standard, and into them the ends of the wire staples are inserted. The long end of the staple is then bent across the edge of the standards, thus preventing the horizontal bars and the uprights from separating by any amount of rubbing, or by expansion and contraction from heat and cold. But while thus securing a perfect connexion, Messrs A. & J. Main's system also preserves the full strength of the bars, and possesses sufficient elasticity to enable the fencing to be carried over undulating ground with facility and taste.

Messrs A. & J. Main's subsoil anchor foot standard is a simple and very effective arrangement for maintaining the wire fence in its place. It resists strain as much as if the standard were soldered into stone. We give an illustration shewing fencing and staple conjoined. (Fig. 115.) From the same firm we have a galvanized iron-curved roof, which is simple, cheap, and durable for a hay shed, or any kind of stacking or covering. This roofing is fixed on rolled girder iron columns, with bases for concrete and eaves beams of wrought-iron lattice. The roofing, indeed, being of wrought iron throughout, and therefore thoroughly fire-proof, is a highly desirable convenience on every farmstead, and on every gentleman's estate, where hay and straw abound. (See fig. 116.) The rick-stands manufactured by this firm are strong and cheap.

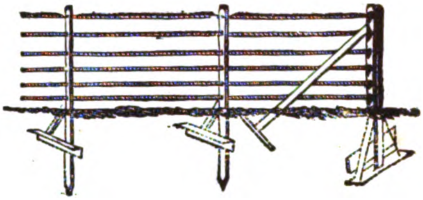


Fig. 115.—Messrs Main's Fencing and Staple conjoined.

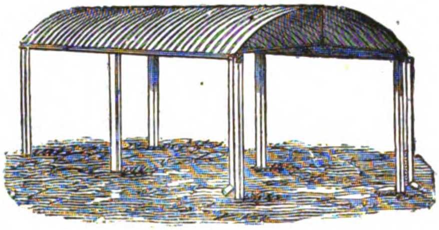


Fig. 116.—Messrs Main's Galvanized Iron-curved Roof.

MESSRS DAVIES BROTHERS' GALVANIZED CORRUGATED ROOFING.

Messrs Davies Brothers, Wolverhampton, make galvanized iron roofing of a light and strong and endurable nature, excellently adapted for the storage of corn, staw, and hay, and for the covering of cattle sheds and farm steadings generally. The Brothers Davies have long been engaged in this kind of manufacture, in which, indeed, they may be said to be *au faite.*

The single-span roof is a good invention, because it can readily be added to as necessity of increased stock or barn accommodation demands. The general width of the single-span roof is about 20 feet. One of these is oftentimes erected, and then, after an interval, as prosperity increases the stores, another is added, or perhaps three or four spans, and thus forming probably a complete covered fold yard, which is a great acquisition to any farm. It is well to make provision for this by any one contemplating this addition to their farm.

MESSRS J. & H. KEYWORTH & CO.'S IMPROVED GRINDSTONE FOR SHARPENING REAPING MACHINE KNIVES.

Messrs J. & H. Keyworth & Co. have introduced an improved grindstone specially adapted for sharpening the knives of mowing and reaping machines. The stone being a compressed one, is entirely free from all irregularities of grit which characterize the ordinary stone. The grindstone is made with either Λ face or flat face, and so arranged as to work either with hand or treadle, the frame being constructed of pitch pine, and the spindle running on friction rollers. The accompanying engraving shews Messrs Keyworth's improved grindstone with the Λ face (fig. 117).

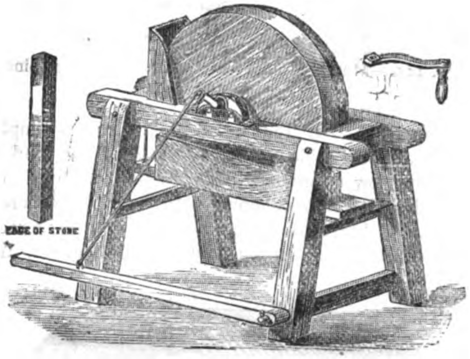


Fig. 117.—Messrs Keyworth's Grindstone.

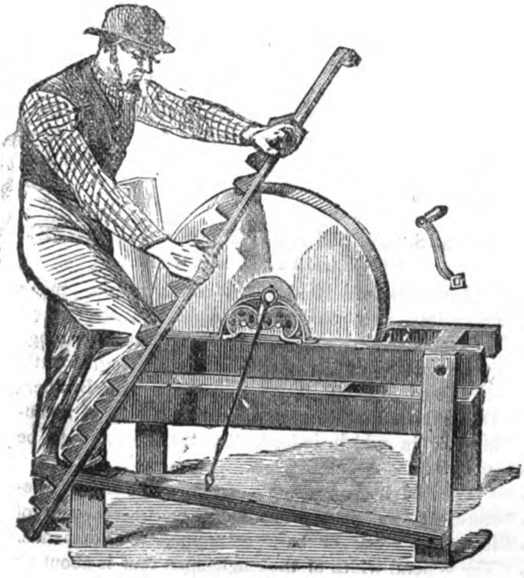


Fig. 118.—Messrs Rollins' Grindstone.

MESSRS J. G. ROLLINS & CO.'S GRINDSTONE.

Messrs J. G. Rollins & Co.'s "Nova Scotia" grindstone, for sharpening reaper and mower knives, is one of the best that we have seen. It is mounted on anti-friction rollers and hard wood frames, and can be worked either by a crank or a treadle. It is fast in sharpening, light, and portable. (Fig. 118.)

MESSRS ASHWORTH BROTHERS' METALLIC COMB-BRUSH.

Messrs Ashworth Brothers, Ashley Lane, Manchester, produce a metallic comb-brush for horses, cattle, and dogs, which is admirably adapted for cleaning the skin of animals. The brushes are made by fixing a number of single wires, each of which is headed like a pin, so as to prevent its coming out of a foundation of a specially-prepared vulcanized india-rubber. These brushes have the penetrating power of the ordinary comb, and the elasticity of the bristle brush besides. We have seen the brush tried on animals, on whom it worked efficiently. (Fig, 119.) Messrs Ashworth Brothers also manufacture a bedroom brush after the same fashion. We have had a little experience of it, and find it agreeable. (Fig. 120.)

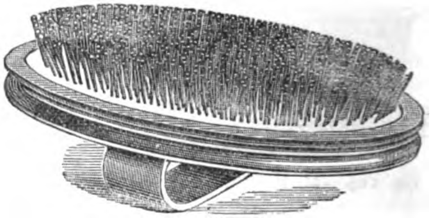


Fig. 119.—Messrs Ashworth Bros.' Metallic Comb-Brush.

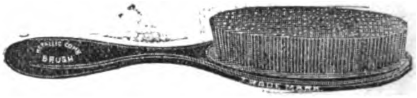


Fig. 120.—Messrs Ashworth Bros.' Bedroom Brush.

MR THOMAS BIGG'S SHEEP-DIPPING COMPOSITION.

The sheep-dipping composition manufactured by Mr Thomas Bigg, Leicester House, Great Dover Street, Borough, London, is one that cannot be too highly recommended to flock-masters as a preventive against or for destroying insects to which "the woolly people" are liable. The tick or bug, which worries the life out of the sheep, prevents them from thriving in mutton, and spoils their wool, is speedily got rid of by using Mr Bigg's sheep-dipping composition; the minute red lice which lurk on the surface of the skin, and are extremely irritating, it finds out and kills; the fly, which is a most annoying enemy to sheep, especially in wooded districts of country, is decimated by this composition; and the scab is prevented or cured by it and Mr Bigg's "Specific for Scab" combined. The composition was highly approved of by the late Prince Consort, no mean agricultural judge, and it is now used with success and satisfaction in most large and select flocks throughout the United Kingdom.

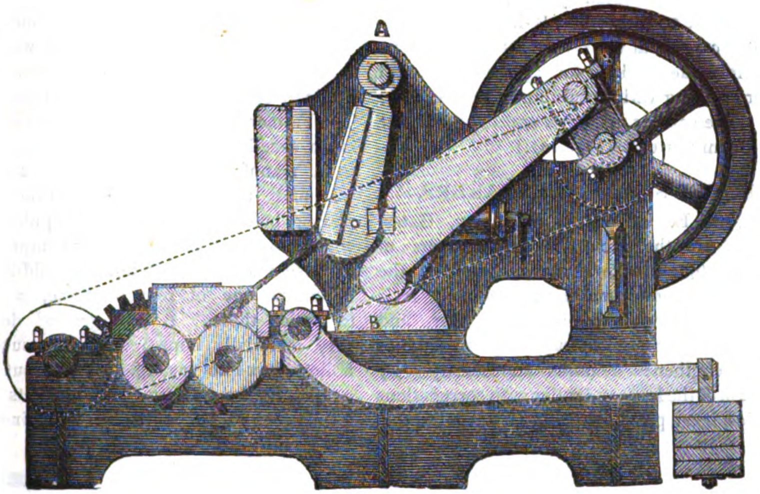


Fig. 121.—Archer's Combined Bone Breaker and Pulverizer (Dunston Engine Works Co.)

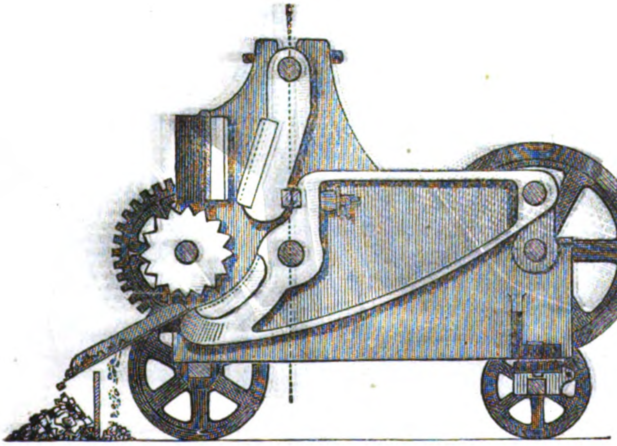


Fig. 122.—Archer's Stone Breaker (Dunston Engine Works Co.)

MR ARCHER'S COMPOUND BONE BREAKERS AND PULVERIZERS.

The Dunston Engine Works Co., Gateshead-on-Tyne, have signalized themselves by the quality of the work which they send forth from their establishment. The compound bone breaker and pulverizer is an excellent machine, being simple and effective. It thoroughly crushes the bones into the particular sizes wanted, leaving them in pieces about ½-an-inch in size; but by means of a patent balance-lever it can be readily made to crush them smaller. The swing-jaw motion is on the eccentric principle, and while the teeth are satisfactorily doing their special work, the capacious and relentless jaw is assisting them in forcing the broken bones into a spout, which conveys them to the rollers that, in their turn, manipulate them as the attendant deems requisite. Any foreign substances, like iron, is rejected by this machine. With Archer's 20- by 7½-inch mouth-crusher, 20 tons of bones can be disintegrated in a day, smaller sizes doing work proportionately in quantity and equal in quality. For greasy or wet bones, a facial roller is added, that, in revolving, carries the bones through the crusher. These machines, it may be mentioned, are manufactured exclusively by the Dunston Co. Archer's bone crusher has been adopted by the largest importer of guano, a machine 20-inches by 7½-inches at mouth, having crushed cargoes at the rate of 6 tons per hour. Small sizes are made specially for agriculturists, and are useful for crushing various substances besides bone and guano. The smaller machines are adapted either for hand or steam power. (Fig. 121.)

MR ARCHER'S STONE BREAKERS.

The Dunston Engine Works Company, Gateshead-on-Tyne, are the exclusive manufacturers of Archer's patent stone-breaker, which is considered the machine par excellence for making road stone. It is coming more and more into use every day, and is now so well known and in such extensive use as to make any lengthened remarks unnecessary. By the combination of the lever and roller with corrugations at right angles, it can produce road metal equal to that broken by hand — the flat pieces of stone being cubed by the cubing roller during the upward motion of the lever jaw. The machine will produce road metal without a revolving screen; but screens and elevators are supplied if wanted. (See fig. 122.) The Dunston Engine Works Co. also manufacture a combined ore-crusher and pulverizer, combining strength and durability with extreme simplicity of construction.

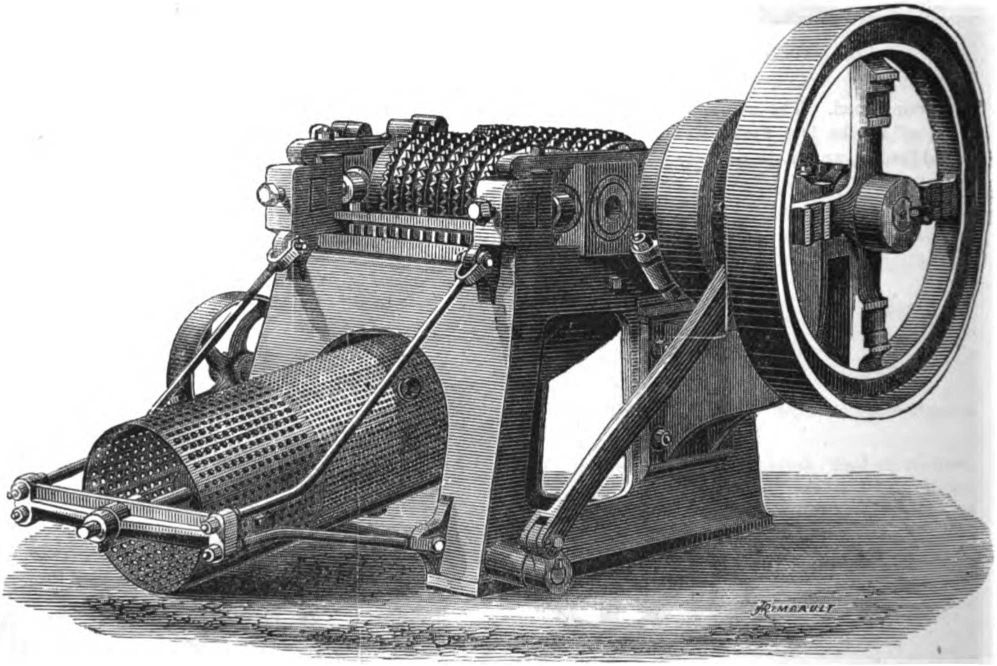


Fig. 123.—Savile Street Foundry Co.'s (Hall's Patent) "Farmer's" Bone Mill.

THE SAVILE STREET FOUNDRY AND ENGINEERING CO.'S BONE MILL.

Within a few years, the Savile Street Foundry and Engineering Co., Sheffield, have established a reputation second to none in their own line. This cannot be wondered at when connected with them is Mr Hall, an engineer well known in connexion with the original stone-breaker of Mr Marsden, of Leeds. The Farmers' Bone Mill, which we illustrate (fig. 123), is an excellent one. Low prices are no temptation to a manufacturer to introduce new goods, yet we find the Savile Street Foundry Company placing before the agricultural public a bone mill which possesses many important improvements, both in design and construction, in addition to the all-important one of reduced price, and we purpose to notice these. 1. The general design has been very materially improved by the substitution of a hollow, box-like casting, panelled out for lightness, containing the bearings and brackets in one piece, from which all the motions are obtained and the revolving screen carried, giving portability and rigidity to the structure. 2. An improved system secures the hardened toothed rings upon the centre shaft, and facilitates renewal or removal. 3. An improved mixture of metal greatly reduces the cost of repairs to the tooth rings in case of breakage, and making them generally more durable as regards crushing bones. 4. An improved frictional driving arrangement, and more perfect balance of the driving parts of the differential gear, so that the rolls will stop in the event of substance getting in more readily than heretofore, with greater steadiness in driving. 5. Reduction is made in price. The mill is made the same as the larger sizes, so that by turning a couple of screws it will open the rolls and admit a large bone, which is first rough crushed, and then passed through again with the rollers closed. By taking off the rings of teeth, and putting on special shells of chilled cast iron, the mill at a trifling cost is fitted to crush coprolites or phosphates. Altogether, important results have been attained, and a mill is produced which should command the attention of agriculturists, and will undoubtedly be much in request by colonists. The arrangement is patented by Mr Hall. The Farmers' bone mill was exhibited at the Smithfield Cattle Club Show, attracting favourable attention, last year.

D. CLARKE'S WHEAT PROTECTOR.

There is nothing more annoying than smut in wheat, unless, indeed, it be those insidious little crawling things known as the slug, grub, or wireworm. It matters not which, D. Clarke's carbolized wheat protector answers to its name, and birds fear to touch it, whilst the dark infertile blight called smut comes not near to the fields sheltered by the protector. It is a capital preservative. The Prince of Wales has used the dressing and found it good.

DOWN'S "FARMER'S FRIEND."

Down's "Farmer's Friend" is an old favourite commodity for preventing smut, the ravages of slug and grub, and stopping the mouths of rooks, which are not always so harmless as they have been represented. Carbolized, its virtues, we are told, come out more prominently. The manufactory is at Woburn, Beds, and Messrs Langton, Edden, Hicks, & Clark, 230 Upper Thames Street, London, are the agents.

MESSRS TOMLINSON & HAYWARD'S PREPARATIONS FOR THE TREATMENT OF STOCK.

Messrs Tomlinson & Hayward, of Lincoln, have long had a name, not only in their own great agricultural county, but throughout the British Isles for the excellence of the various articles they manufacture for the treatment of stock. Their glycerine dip, which is extensively used in the Colonies and other wool-growing countries, for the use of scab in sheep, is also valuable for its beneficial effect in increasing the growth and quality of the wool; in the destruction of ticks. lice, and all parasites, its action is rapid and effective. They also now manufacture the "Original Luddington's Oils," the celebrated horse, sheep, and cattle medicine, used almost exclusively in the counties of Lincolnshire and Yorkshire as a lambing oil, and in cases of difficult parturition in mares and cows; it is equally valuable in cases of colic, diarrhœa, &c. For improving the quality and increasing the quantity of butter, Tomlinson & Co.'s "butter powder" is widely known and appreciated.

MESSRS BRADFORD & CO.'S WASHING AND WRINGING MACHINES.

There is scarcely a farm or country house in which Messrs Thomas Bradford & Co.'s washing and wringing machines are not, if we may be permitted the phrase, a welcome and respected guest who is always entertained. "To welcome the coming" is, indeed, the pleasure of all housewives in the case of Messrs Bradford & Co.'s washing machines, but to "speed the parting guest," no, never! Upwards of 160 medals have been awarded to Messrs Bradford & Co., several of an International character. At the Paris Great Exhibition last year, Messrs Bradford & Co. obtained three silver medals. Their "Vowel" washing machines are remarkable for their easiness of working, their economy of water and soap; and they have no internal machinery to injure the articles, however gossamer-like the fabrics may be. (Fig. 124.)

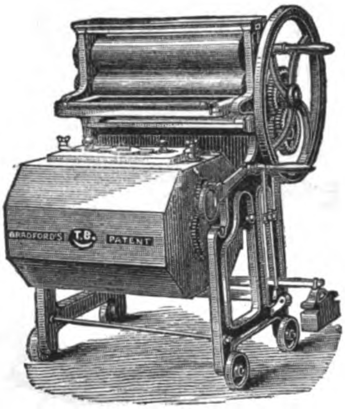


Fig. 124.—Messrs Bradford & Co.'s "Vowel" Washing and Wringing Machine.

MESSRS HORNSBY & SONS' HEDGE CUTTER.

One of the greatest novelties of last year was decidedly the hedge-cutter manufactured by Messrs Hornsby & Sons, Spittlegate Ironworks, Grantham. The cutting of hedges is an expensive matter when done by hand; too frequently, on account of the expense attending their cutting, hedges are allowed to run wild and overshadow the headlands. Messrs Hornsby's machine looks a little cumbrous on first sight, but it really is not so; in fact, it is easy of working, the bar with the cutting apparatus being so arranged as to be ready of adjustment to suit either a tall or a short growth of hawthorn. It gained a special silver medal at the Royal at Bristol. We give an illustration of this machine (fig. 125).

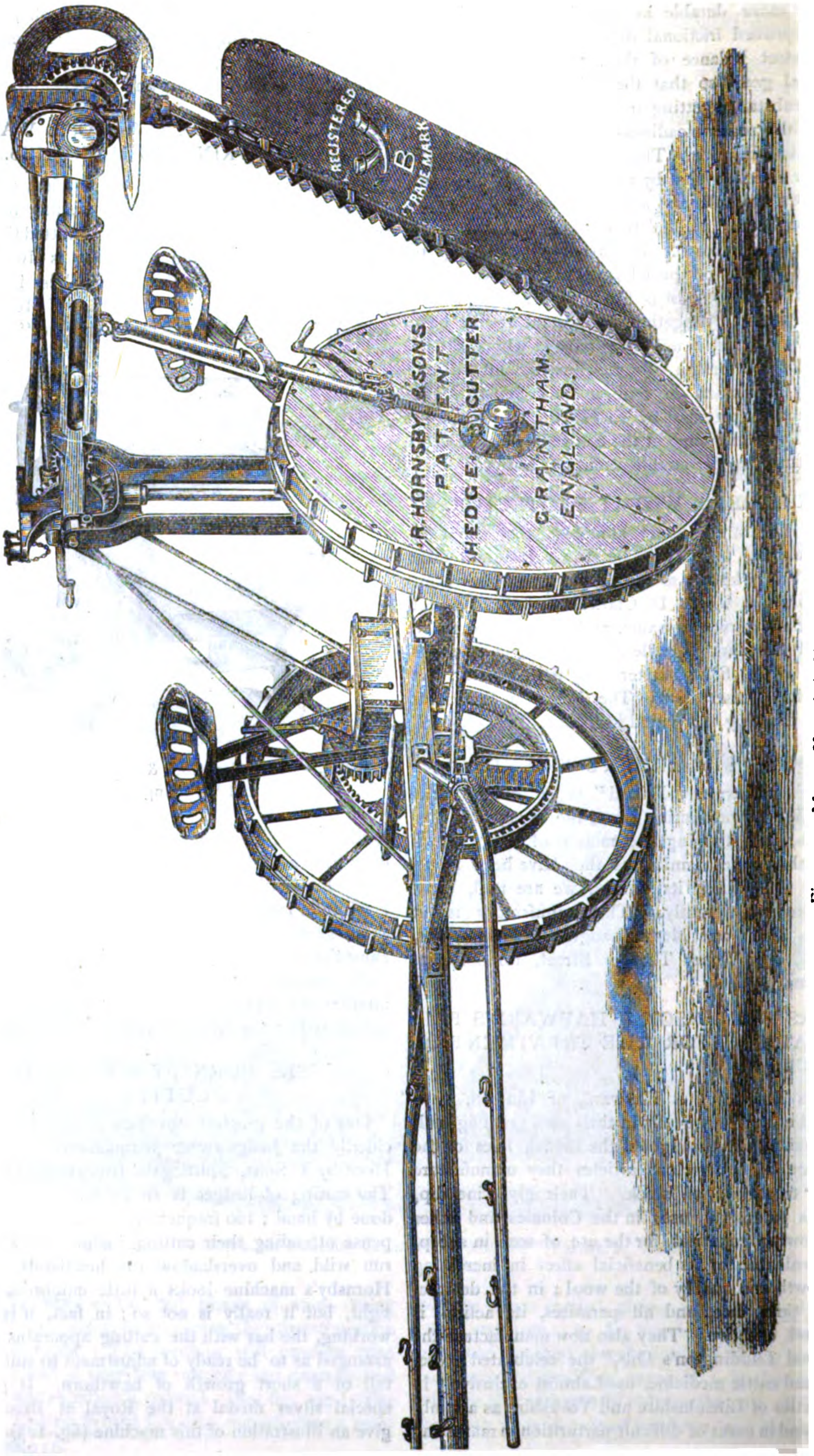


Fig. 125.—Messrs Hornsby's Hedge-Cutter.

MESSRS COLEMAN & MORTON'S HAND WATER-CART.

Messrs Coleman & Morton's (Chelmsford) hand **water-cart** and garden engine is admirably adapted for gentlemen's gardens and grounds. It is a thorough economizer of labour in the conveyance of water from one portion of the grounds to another. The delivery valve can be worked at the outlet when filling a watering-pot. This handy little cart, the capacity of which is equal to 35 gallons, is also fitted with a spreader for watering lawns, paths, or carriage roads, the appendage being easily removable. The carts are arranged for the attachment of a garden engine powerful enough to water trees, and, in case of necessity, to stem an incipient fire. (Fig. 126.)

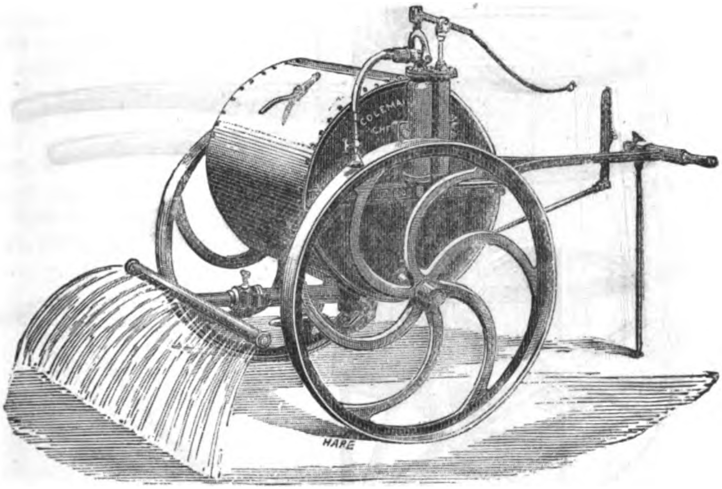


Fig. 126.—Messrs Coleman & Morton's Hand Water-Cart and Garden Engine.

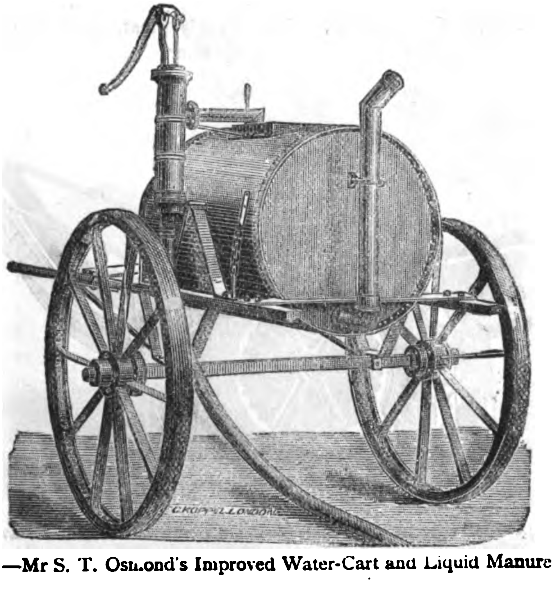


Fig. 127.—Mr S. T. Osmond's Improved Water-Cart and Liquid Manure Drills.

MR S. T. OSMOND'S WATER-CART FOR STEAM CULTIVATION AND LIQUID MANURE DRILL.

We give a representation of one of the water-cart manure drills manufactured by Mr S. T. Osmond, Newton Foundry, Ramsbury, Wilts, which are suitable for general agricultural purposes, with pumps and hose attached, tubular iron shafts and frames constructed of wrought Channell iron, fitted with patent lock bolts, preventing the possibility of the nuts getting loose by vibration. They are mounted on Mr S. T. Osmond's patent wrought-iron wheels, making them the best water-carts for steam cultivation and liquid manure drills. (Fig. 127.)

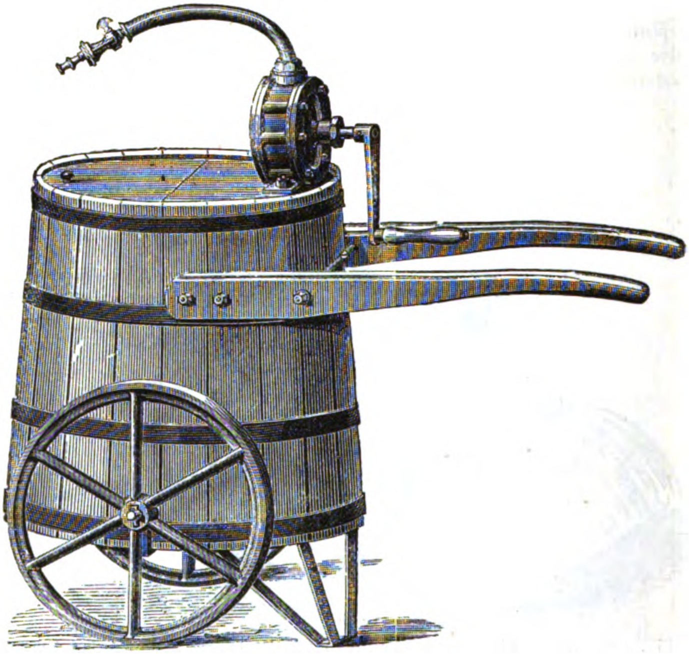


Fig. 128.—Messrs Hydes & Wigfull's "Stanley" Garden and Fire Engine.

MESSRS HYDES & WIGFULL'S GARDEN ENGINES.

Messrs Hydes & Wigfull, of Sheffield, manufacture a garden engine of an extremely efficient character. It is strong in construction, yet easy of removal from place to place, and in case of fire in a mansion, where other engines are not near at hand, its aid is invaluable. The force with which water is ejected through the hose is great, and it is quite under the control of the operator.

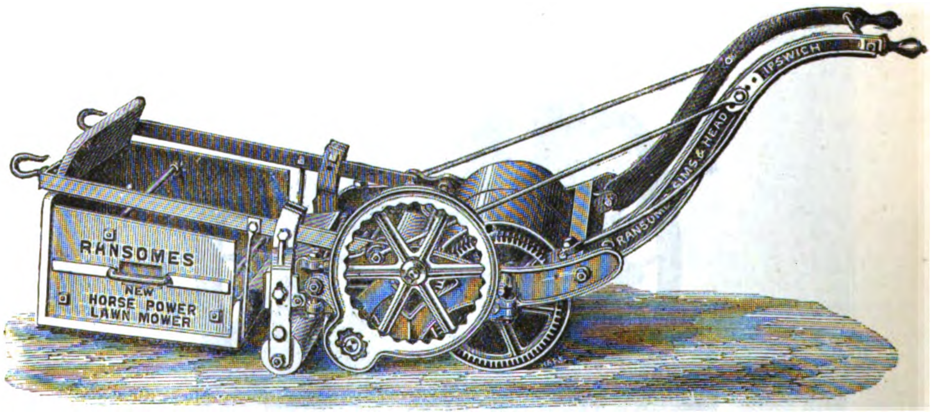


Fig. 129.—Messrs Ransomes, Sims, & Head's New Horse-Power Lawn Mower.

Bennison's rotary pumps, sold by the same firm and worked by hand power, can lift water from a depth of 27 feet with ease, and is so scientifically arranged, that with 1-inch pipes mounted on a pillar with competent gearing and fly-wheel, it can raise, by the aid of one man, from 9 to 15 gallons per minute. This is the small pump. With a little more exertion, with larger rotary pumps on the same principle, from 40 to 60 gallons per minute can be raised and distributed to a considerable height. We give an engraving of the engine. (Fig 128.)

MESSRS RANSOMES, SIMS, & HEAD'S LAWN MOWERS.

This firm has long been noted for the manufacture of lawn mowers, big and little. Their "Reversible" is a very compact and clean cutter, light and easy, and no villa garden is complete without such a machine, which is specially adapted for small lawns and for cutting borders. For lawns of "larger growth," as we may call them, the "Automaton" cuts cleanly and rolls well. The horse-power lawn mower, which we illustrate (fig. 129), is suitable for grounds of more expanse, such as public parks, cricket grounds, croquet lawns, &c. Without complicated machinery, this mower can deliver the grass from the box at either side; it is strong, the adjustment for setting the knives is simple, the gearing works direct on the driving spindle, and the box, folding over the machine, enables it to be stowed into small compass.

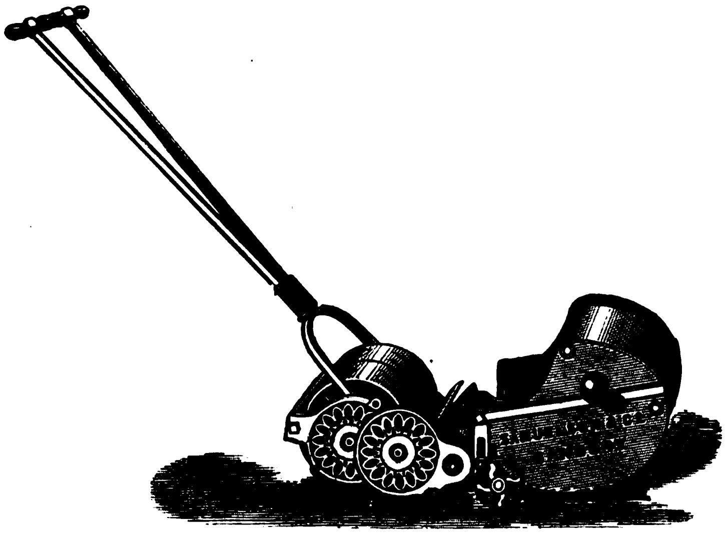


Fig. 130.—Messrs Samuelson's "Favorite" Lawn Mower.

MESSRS SAMUELSON & CO.'S LAWN MOWERS.

Messrs Samuelson & Co.'s (Banbury) lawn mowers have been highly appreciated wherever they have been tried. Where all is good alike, it would be invidious to pick out one, but we must name the "Favorite" (fig. 130). It is a capital silent and ready worker. Its construction is marvellously simple, and by a careful arrangement of the gearing it is well adapted to cut close up to trees and the verges of flower beds and borders. It can either be pushed forward in the ordinary way, or, by reversing the handle, it can be drawn from the front; this will be found a great advantage in narrow or confined spaces. The grass, instead of being caught in the box as it is cut, can be distributed and left on the lawn, if desired, by simply removing the collecting box, and the loose sheet iron wind-guard inserted at the back of the cutters. It cuts on slopes as cleanly as on the flat.

MESSRS ROWATT & SON'S NEW DUPLEX LAMP.

For more than a quarter of a century the enterprising firm of Messrs Rowatt & Sons, Fountain Bridge, Edinburgh, and 144 City Road, London, have been devoting unwearied efforts to the production of lamps that would give a softer, a brighter, and better light than gas at a cheaper rate—in fact, it may almost be said, without persiflage, that Messrs Rowatt's lamps have been forerunners of the electric light. What may be called their first grand innovation upon the old style of lamp—ugly and cumbrous in most cases—was to have their designs for stands and globes of handsome and artistic character. Next, their object was to get rid of the unsightly chimney, which, besides being offensive to the eye of taste, was a source of annoyance and expense in the way of breakage, especially in country houses, where new funnels could not readily be obtained, and in towns, where it is not very easy at all times to purchase a chimney to fit a particular lamp. The Anucapnic lamp accomplished this, with the result of giving a greater illuminating power. Their latest improvement is Rowatt's Anucapnic Duplex lamp, brought out for the first time this season, and which decidedly gives more light out of a given quantity of oil than any lamp that has yet been brought before the public. Tested by the photometer—there is no deception as to the capacity of the illuminating power of the Anucapnic Duplex lamp—it emits light equal to 35 standard sperm candles. The "split-wick burner" is so constructed that it will carry a full flame till every drop of oil in the lamp is exhausted. This result is achieved by using two wicks, or a split wick in the tube, instead of one solid wick. The two wicks placed evenly together, introduced to the lower end of the wick tube, are caught by the ratchet, and the meshes and threads are so closely pressed into each other that the two wind up and down as accurately and easily as if they were one wick. The parts of the wick below the burner, however, remain separate, and thus there are four surfaces of the wick exposed to saturation by the oil instead of two, as would be the case if only one wick were used. The flow of oil to the flame is continuous and abundant.

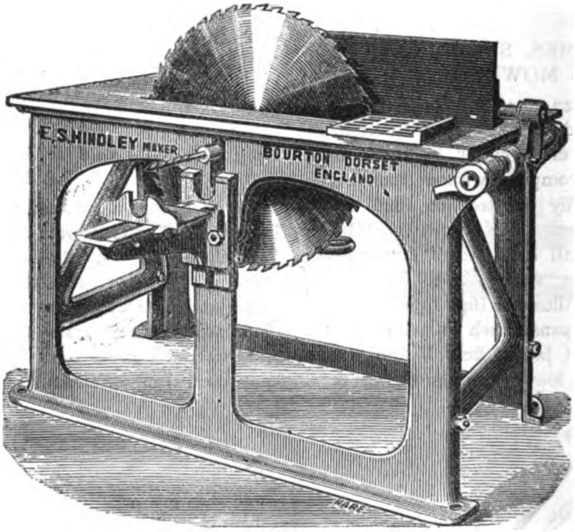


Fig. 131.—Mr E. S. Hindley's Circular Saw Bench.

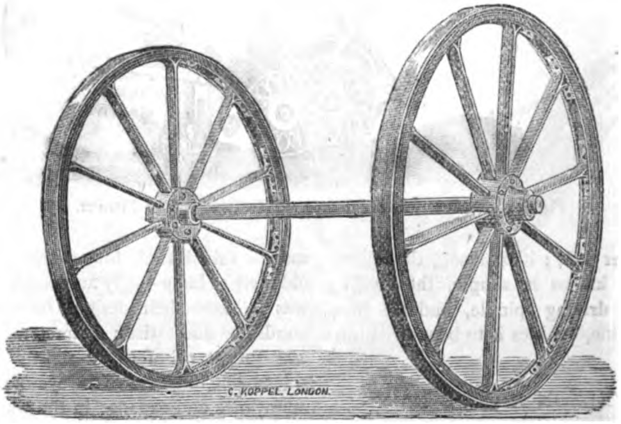

C. KOPPEL LONDON.

Fig. 132.—Mr S. T. Osmond's Patent Wrought-Iron Wheels.

A noticeable advantage in this lamp over others that the two wicks are turned up or down by one winder of simple construction, and should one by any possibility rise higher than the other—a contingency not at all likely—a little thumb spring is supplied to the Duplex burner, which, being pressed, holds the one wick tight, while the other can be raised or lowered to the level as required. This lamp, which can be had in many beautiful designs, is admirably adapted for lighting up the baronial hall, the country mansion, or the suburban villa.

MR E. S. HINDLEY'S CIRCULAR SAW BENCH.

Mr E. S. Hindley, Bourton, Dorset, to whose vertical engines we have referred under another heading in the ALMANACK, has manufactured a new circular saw bench which is easily driven by his engine. These saw benches have a well-planed top, and the frame is of a new design, rendering it peculiarly strong, rigid, and steady in work. The spindle runs in very long gun-metal bearings, which are adjustable. The spindle is raised or lowered by a screw and hand wheel, and can carry two saws, if required, for tenoning, rebating, grooving, &c. They have fast and loose pulleys The fence has a fine screw adjustment, can be inclined at any angle for level cutting, or can be instantly thrown over, leaving the table clear for cross-cutting. The carrier plate runs in a groove on the table, and is most useful for cross cutting, mitreing, &c. The boring table has a vertical adjustment, and holes can be bored at any angle. A band saw can be added. (Fig. 131.)

MR S. T. OSMOND'S PATENT WROUGHT-IRON WHEELS.

Mr S. T. Osmond, Newton Foundry, Ramsbury, Wilts, manufactures iron wheels which may be confidently recommended as being durable, and not influenced at all by the weather. These wheels have recently been improved, and are now used in most parts of the country and the colonies. Their advantages are, in case of repairs, that the spokes, nave, and the whole of the wheel can be taken apart and boxes easily replaced, when worn, by any ordinary mechanic. (Fig. 132.)

MESSRS DAVIES BROTHERS' SUMMER-HOUSES.

Winter or summer, we all like to have a shelter from the sun, or the rain, or the wind in the garden. The houses of Messrs Davies Brothers', Wolverhampton, are formed of galvanized corrugated iron on wood framing. The interior is lined with match-boarding, and stained. This firm makes various designs, such as square and octagon shape, with either straight roofs, or curved ; and with the addition of stained glass to the windows, and the exterior tastefully painted, very good effects are produced.

MR C. D. PHILLIPS' AGRICULTURAL IMPLEMENTS.

Mr Charles D. Phillips, Newport, Monmouthshire, is always abreast with the times. There is not a good article produced in connexion with mechanical agriculture which is not to be found down at Newport, from a common spade to the best of ploughs, and from a sickle and scythe to the most approved horse reaper. The chaff-cutters Mr Phillips sells are selected with care and skill, as, indeed, are all the miscellaneous articles in his wondrous store. His waterproof covers, manufactured at his extensive works, and patronized by Royalty, noblemen, gentlemen, and implement agents throughout the kingdom, are now well known and appreciated.

MESSRS HYDES & WIGFULL'S STANLEY BICYCLE.

Bicycling has now become what may be called a feature of the age. Indeed, it may almost be said that young men and maidens, and men beyond the meridian of life, like to exercise their limbs upon them. Messrs Hydes & Wigfull's bicycle is made with great skill out of the best materials, and only a bungler could break it. It has a handy brake on the front wheel, as will be seen from cut (fig 133.) The celebrated rider, W. Cann, recently rode 1060 miles in six days on one of How's Roadster machines, beating all competitors, and the machine was perfect after this terrific strain.

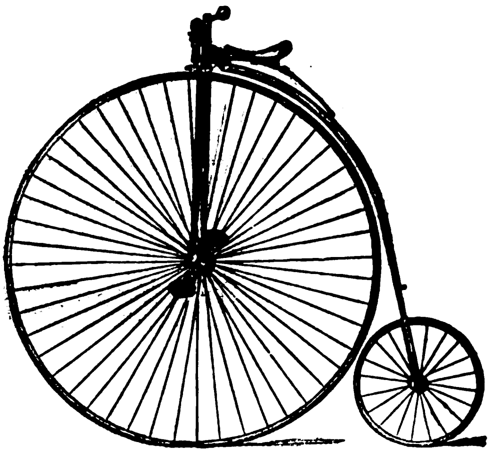


Fig. 133.—Messrs Hydes & Wigfull's "Stanley" Bicycle.

MESSRS MUSGRAVE & CO.'S PATENT STABLE FITTINGS.

Messrs Musgrave & Co. (Limited), of Ann Street Ironworks, Belfast, and of 97 New Bond Street, London, make admirable stable fittings ; their chief features being perfect comfort and safety to the horse, great strength and durability, combined with a light and elegant appearance. Messrs Musgrave & Co.'s stable fittings have been manufactured after the most careful consideration, and they are of a compound character, wrought iron and cast iron being employed in their construction—the wrought iron for hay racks and sliding barriers for separating the horses at night, for the openwork of the stall and loose box divisions, the framing of the loose box doors, &c.; but they have found it better, in all cases, to use cast iron for the pillars, and, in our opinion, they are right. The excellence of all the work, and the arrangement of Messrs Musgrave's stables, were publicly acknowledged at the Paris Exhibition, of 1878, by the Prince of Wales, all of whose new stables, as well as those belonging to the Duke of Edinburgh, have been erected by this firm for the last twelve years, and have given the greatest of satisfaction—their draining, lighting, and ventilation being perfect. Their harness and saddle rooms are splendid specimens of cabinet work.

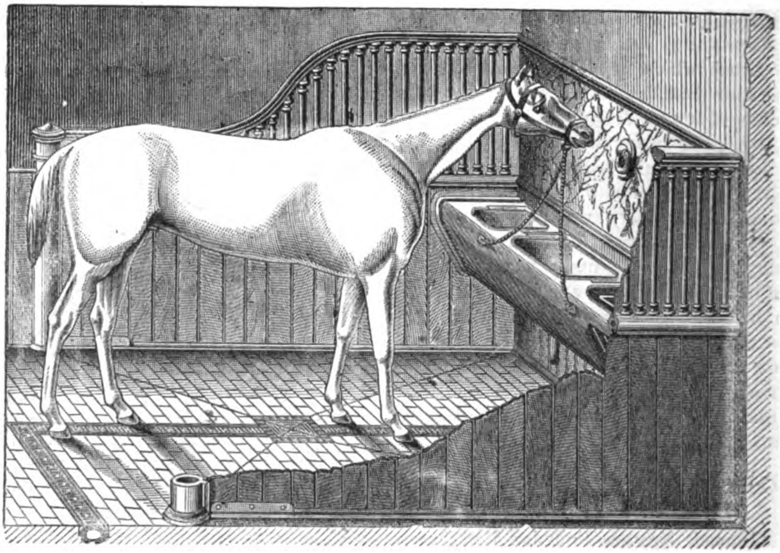


Fig. 134.—Messrs Musgrave's New Patent Harmless Manger Fittings.

MESSRS MUSGRAVE & CO.'S PATENT MANGER FITTINGS.

Messrs Musgrave's patent manger fitting is worthy an illustration (fig. 134). It has a wrought-iron safety front and improved plan of double tyings. The fitting is got up with the greatest care, and has been designed so as to afford, in every point, absolute safety to the horse. The manger-trough and water-pot are of an improved form, preventing waste. They are constructed according to a recently-patented arrangement, which allows of the manger-trough and water-pot being instantly tumbled over or removed for cleaning by the attendant, while to the horse it is as immovable as any other part of the stall. The hay-rack, manger-trough, and water-pot are made so perfectly smooth and flush inside that they offer no projection on which a horse can injure himself while feeding. When tumbled over, the two latter discharge their contents through a chamber and waste-pipe directly into the drain, thereby flushing it out, and keeping it clean and free from smell.. The entire front of the manger fitting is made of wrought iron, carefully rounded off at every point, and sloping away from the horse's knees.

Messrs Musgrave & Co. have also prepared designs adapted for stability on farms for draught horses; and their cow-sheds and stalls for cows are all that can be desired by the most careful cow-feeder, being perfect in their arrangements for feeding and ventilation. They are wholly made of iron—compact, clean, an inexpensive. Disinfectants can be easily applied to the walls should disease occur in the stalls, which is not likely, unless it be imported. Messrs Musgrave & Co.'s iron dog kennels and piggeries are conducive to cleanliness and health. In addition to the numerous prizes already gained by the excellence of their work, Messrs Musgrave have just been awarded several prize medals at the Paris International Exhibition.

MR WYATT J. PETTITT'S IMPROVED BEE-HIVES.

Perhaps there is no more profitable stock on a hill farm than bees. They can feed among the heather as well as mountain sheep, and when carefully attended, they can bring back larger profit for the outlay upon them than four-footed animals in such districts. In fact, there is no outlay upon them save the first cost—and that is not extravagant, and the little time taken up in caring for the bees should not be reckoned, as it is a pleasure to see them working. There is no one who has done so much to popularize profitable bee-keeping as Mr Pettitt, of the Apicultural Institute, Dover. This gentleman has invented hives which secure the easy making of honey. The hives are ornamental. They enable the owner to watch the gradual development of the comb, and the interesting habits of the occupants of those tiny cells. Proper ventilation and protection from the changes of climate are also provided by these appliances, as well as facility for removing the stock of honey without having recourse to the barbarous and now almost obsolete custom of "brimstonism."

In Mr Pettitt's bee-house the principle is adhered to that no bee can escape inside the houses, whilst the temperature and ventilation are regulated by simple and easily managed appliances. By these inventions bees are induced to build their combs in frames, which not only insure that their architecture shall be straight, but also give facilities for examining the comb while the work is in progress.

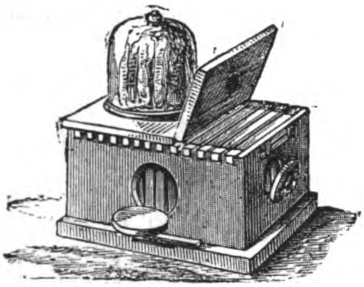


Fig. 135.—Mr Pettitt's New Movable Comb Hive.

Mr Pettitt's new movable comb hive is worthy of an engraving (fig. 135). It is aptly named the "Hive of Hives." It is fitted with his patent metal rack (fig. 136). The frames are on the natural scale of 1⅜-inch from centre to centre of combs. It contains thirteen bar frames and one dividing frame, by which the size of the hive can be enlarged or contracted at pleasure. The portion of the crown board which covers the four spare frames is provided with a ventilator similar to that in the top of the super in "Pettitt's Collateral Hives." The hive is, in fact, a combination of the storifying, the collateral, and the bar-frame systems, and with the projecting top bars every comb can be loosened previous to the removal of the crown board. We confidently recommend this hive to all who keep bees, and to all cottagers who in agricultural localities do not at present keep them, but who might do so, and add easily to their not over-large regular wages.

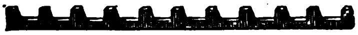


Fig. 136.—Mr Pettitt's Metal Rack.

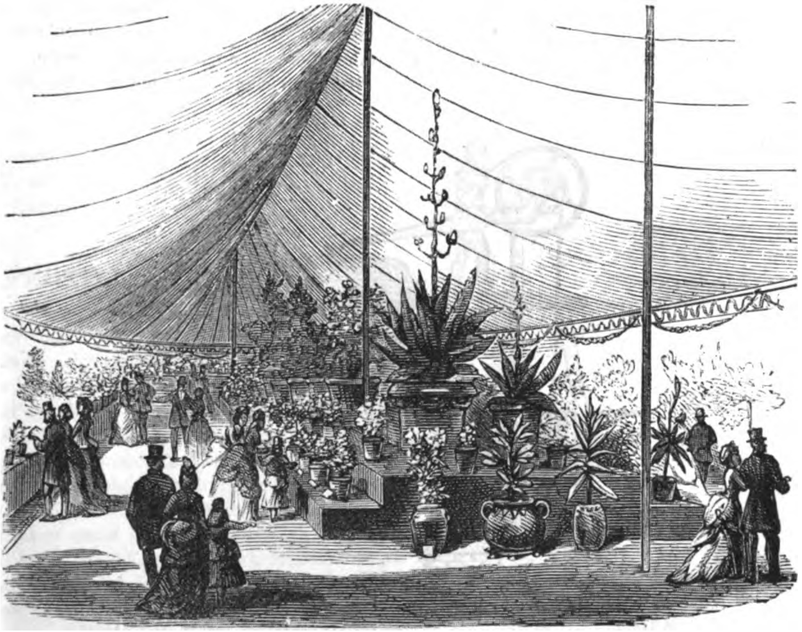


Fig. 137.—Messrs John Edgington & Co.'s Horticultural and Floricultural Tent.

MESSRS JOHN EDGINGTON & CO.'S TENTS.

"To your tents, O Israel," was certainly the cry at many of the agricultural gatherings last season, at many of the horticultural ones likewise. There never has been a season that we can remember where tents at public exhibitions and garden parties were so much required; as also on cricket fields and in villa gardens. Messrs John Edgington & Co.'s (48 Long Lane, West Smithfield, London) experience of tent-making is nearly coeval with the beginning of the century. In 1805 they started their business, and they have been patronized by Royalty, by peer and peasant, for tents as well as for preserving cloths, and for trophy flags on great occasions, as well as for those more moderate banners and bannerets which are presumed to give *eclat* to provincial demonstrations. It can safely be said of Messrs John Edgington & Co.'s tents that they are thoroughly waterproof. Their marquees for horticultural, floricultural, and agricultural purposes are spacious, and fitted with stages covered with baize. They are easily erected and taken down. We illustrate one of these horticultural tents. . (See fig 137.)

Messrs John Edgington & Co.'s (48 Long Lane, West Smithfield, London) marquees for cricket clubs, archery associations, and other societies of a similar character, are extremely convenient, handy, and lasting;

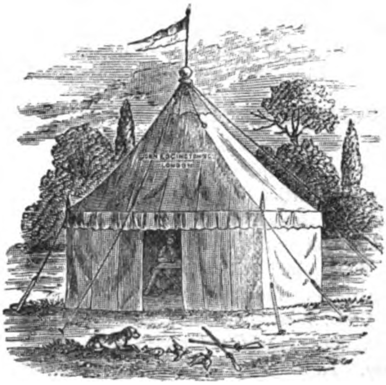


Fig. 138.– Messrs John Edgington's "Square" Tent.

and their square garden tent, which we figure, is a marvel of convenience; chairs and tables are supplied with them, and they can be fitted on framework, so doing away with the central pole. (See fig. 138.)

The patent garden canopy tent is exceedingly easy of erection, and in summer time one of the pleasantest shades possible under which to enjoy a weed or a glass of sherry, or take shelter from a passing shower. It is moderate in price.

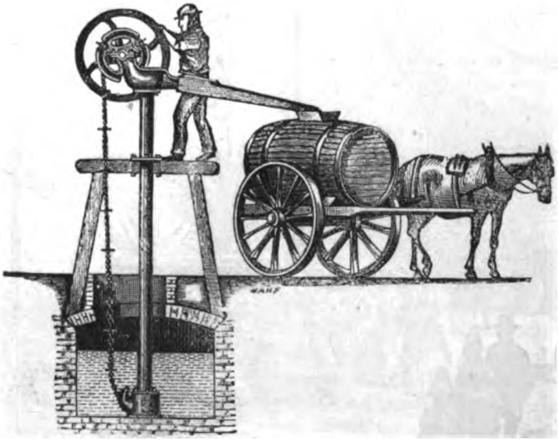


Fig. 140.—Messrs Bamford's Chain Pump.

MESSRS HENRY BAMFORD & SONS' PATENT CHAIN AND LIFT PUMPS.

This firm has long been favourably noted for their pumps of various sizes, and designed for several uses. They are so simple in construction in their working parts that, without disturbing the pump itself, any good mechanic can, without difficulty, examine and take to pieces the bucket and valves; and, however much the valves may be worn, they can in a few minutes be made perfect, without resorting to the maker for fittings

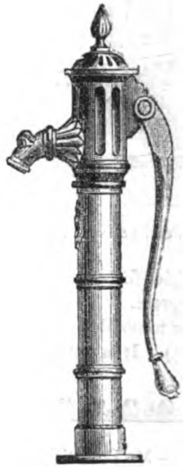


Fig. 139.– Messrs Bamford's Pump.

to supply the deficiency. See fig. 139. Messrs Bamford's chain pumps for liquid manure have perfect immunity from frost, because when not in working order there is no fluid in the pump. Having no valves or buckets, it cannot well get out of order if fair play is accorded to it; it is not liable to clog under any ordinary circumstances, and requires only the strength of a boy to work it, so easy is it in its friction. (See fig. 140.)

MESSRS CARSON & TOONE'S LAMB CREEP.

Messrs Carson & Toone's (Warminster, Wilts) lamb creep continues to be the best protection for lambs that has yet been invented. The peculiarity of the patent consists in a free opening of the roller frames from the outside, with rigidity against pressure from the inside, and their automatic action in closing by means of springs. (See fig. 141.)

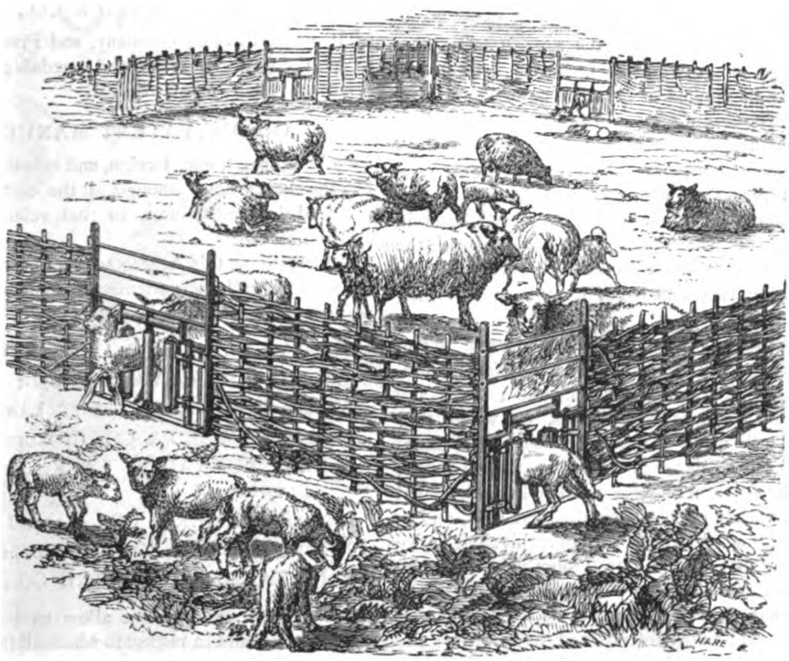


Fig. 141.—Messrs Carson & Toone's Lamb Creep.

FERTILITY OF LAND.

Where Nature has been niggardly to the soil, or where her fine chemistry and geological changes have formed rich and generous land, and such land has become impoverished by exhausting crops, the farmer's work is to raise or restore the natural soil to a state of fertility. This he accomplishes by restorative or strengthening manures, and such work has become easy nowadays, thanks to an improved knowledge of chemistry, which directs us what to do, knowing what has been taken out of the land by cropping. Readers of an old book, the "Farmer's Muck-Manual," know the value of farmyard dung, and experiments of past years have introduced bones and stones (coprolites), fish and lime, rags and refuse, nitrate of soda, blood, and a number of substances once considered "waste." Amongst them all, guano, as imported direct in its genuine raw fertility by

THE PERUVIAN GUANO COMPANY,

has won and keeps the favour of farmers all over the world. It is the real stuff, the base and strength of our best harvest fields. Now and then a foot of ground may get too much of the good thing in a big lump of the raw material, but a crack from a shovel should knock these lumps into serviceable size when the cargo is unloaded, just as the old-fashioned workman bangs a big "spit" of farmyard dung into fragments. To tell a farmer that guano is valuable is to tell him what he knows, and we have but to give him a single reminder ; over every bag of guano the buyer cannot be too particular in seeing that he gets the genuine article. This precaution is always necessary, and such as all honourable sellers challenge, for their own protection and that of their customers. The Peruvian Guano Company therefore test and guarantee every cargo received, and thus each transaction is indisputable, and the buyer is made secure.

The process of dissolving the Peruvian Government Guano was a natural sequence to the introduction of this most valuable agent, obtained from different deposits and varying somewhat in power and condition; and

MESSRS OHLENDORFF & CO.,

in their "Dissolved Peruvian Government Guano," submit to agriculturists a material that quickly earned universal approval and acceptance, as whilst preserving a guaranteed amount of the special and original fertilizing virtues of guano, sulphuric acid fixes the volatile carbonate of ammonia, and renders soluble and more efficacious the phosphates. Moreover, uniformity of composition and a dry powdery condition are attained, and, as in a measured chemist's glass, the exact dose required by the patient under treatment can be given, and its effects regulated. Thus, if the crop is required to make a great effort at a certain stage of growth, the fertilizing, stimulating pressure can be applied at the right moment. Under these circumstances of what may be called adaptability to the skilled agriculturist's manipulation, dissolved Peruvian guano has become the cereal and root growers' right-hand power and reserve force. Being also like the raw material analysed and guaranteed, purchasers in both cases know what they buy, and can compare the proportion of elements contained by either the raw or dissolved guano, and make up the sum of their respective value.

The opinions of learned experimentalists in regard to either the raw or the dissolved guano form unimpeachable evidence in their favour, and rank both of them as the best farmers' friends, on whom they may confidently rely. As to which side the balance of merit and the balance of cheapness falls, we must refer to the decision of wide practice in their actual use over a variety of crops, on different soils, and in different seasons; and we may conclude this short notice by observing that the array of favourable opinions by those who have used, and who continue to use, the genuine guano as imported and in its dissolved state, fully prove that both deserve and have earned the farmer's complete satisfaction; and when a farmer is satisfied, the gold medal of Paris can only set its seal to a conclusion in witness that his satisfaction is justified.

We note among other fertilizers our agriculturists swear by, and which are being constantly named in the prize lists of our root shows, that the phosphates, coprolites, nitrates, and sulphates of

E. PACKARD & CO.,

of Ipswich, London, Germany, and France, continue to gain golden opinions and medals; whilst the "farmers' own," as we may call

ODAMS' PATENT MANURES

for all cultures, home, foreign, and colonial, keep and enlarge their ground amongst all the competitors that practical husbandry uses, or that science discovers and improves.

Addressed as this ALMANACK is to practical men, we need but call their attention to the various special manures, of established repute, of

MESSRS LAWES & CO., MARK LANE;
LANGDALE'S CHEMICAL CO.;
MESSRS GIBBS & CO., MARK LANE;
MESSRS H. WEBB & CO., WORCESTER;
MESSRS BURNARD, LACK, & ALGER, PLYMOUTH;
MESSRS FARMER & CO., MARK LANE;
MESSRS STEVENS, SONS, & CO., MARK LANE;
THE FARMERS' MANURE CO., ROYSTON;

to which our space does not allow us more particularly to refer, and in respect to which all that is wanted is, not commendation, but—money to buy, and skill to apply, them.

RICHMOND & CHANDLER,

SALFORD, MANCHESTER,

MANUFACTURERS OF

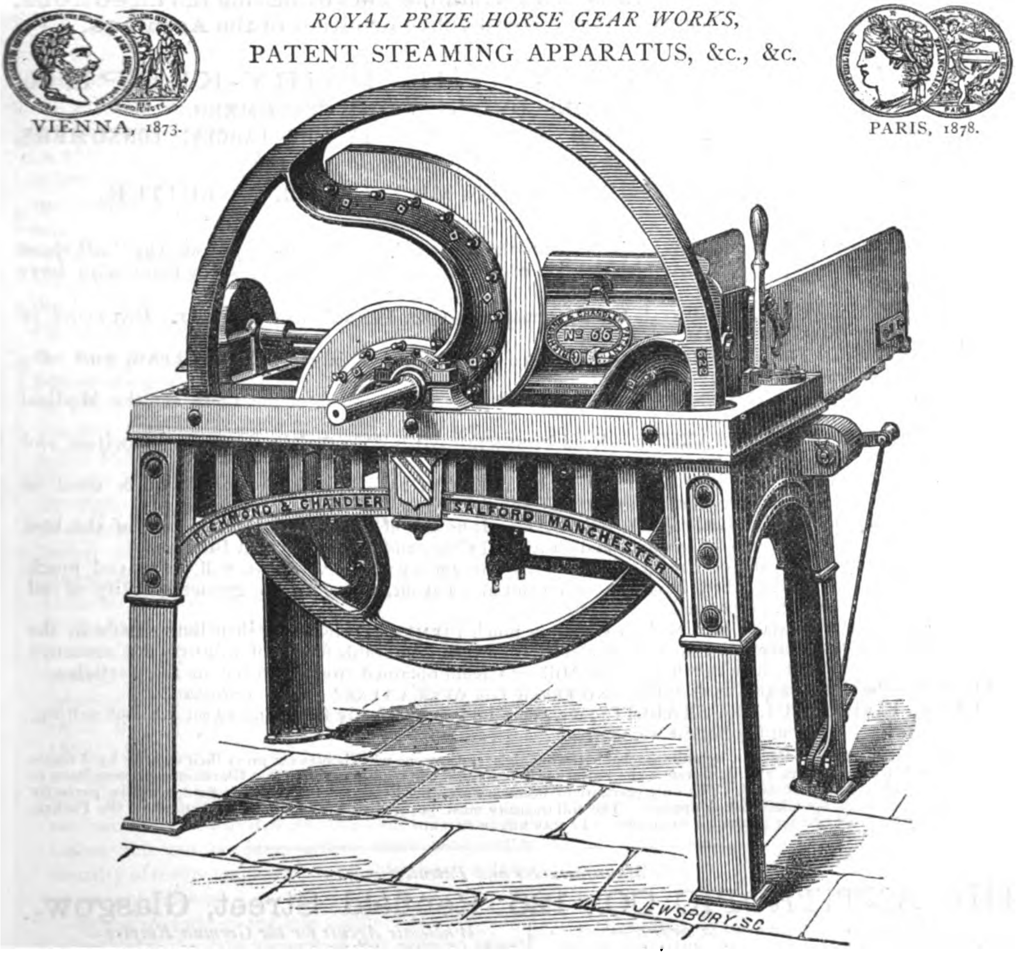
ROYAL FIRST PRIZE AND EXHIBITION MEDAL

CHAFF-CUTTERS,

NEWLY IMPROVED CORN-CRUSHING MILLS,

ROYAL PRIZE HORSE GEAR WORKS,

PATENT STEAMING APPARATUS, &c., &c.



VIENNA, 1873.

PARIS, 1878.

RICHMOND & CHANDLER'S CHAFF-CUTTERS have taken the **PRIZE** of the **ROYAL AGRICULTURAL SOCIETY** of **ENGLAND** at every **COMPETITION** since **1854.**

At the MEETING of the AYRSHIRE AGRICULTURAL SOCIETY at AYR,

RICHMOND & CHANDLER'S CHAFF-CUTTER (No. 66)

WAS AWARDED

THE GOLD MEDAL,

IN COMPETITION WITH CHAFF MACHINES BY ALL THE LEADING MANUFACTURERS.

Catalogues free by post on application to RICHMOND & CHANDLER, SALFORD, MANCHESTER.

Of Vital Importance to Dairy-Farmers, Milk-Vendors, &c.

GLACIALINE! GLACIALINE! GLACIALINE!

The Dairy-Keepers' Blessing, and Safeguard of the People's Health.

Prospectuses, with Testimonials from Eminent Professors, Scientific and Medical Men, as well as hundreds from the Dairy Trade in Great Britain, France, Germany, Austria, &c., sent Gratis, with a Sample Packet having full directions, on receipt of two penny stamps at the Head Office or either of the Agencies.

ENORMOUS SAVING TO THE DAIRY-KEEPER.

NO MORE GRUMBLING DISCONTENT FROM CUSTOMERS.

NOT A SINGLE DROP OF MILK OR CREAM NEED BE LOST BY THE LARGEST CONSUMERS,
Even in the Hottest or most Muggy or Thundery Weather.

NO MORE HORRID TURNIP TASTE IN MILK, CREAM, OR BUTTER.

The advantages enumerated above, together with those given below, are the "reasons why" all those Dairymen who have not yet tried GLACIALINE are confidently recommended to do so by those who have had daily experience of it for years.

1. GLACIALINE IS CHEAP.—It costs the Dairyman only ONE PENNY to save FIFTEEN GALLONS of MILK or CREAM.
2. GLACIALINE IS ECONOMICAL.—Milk treated with it gives a larger yield of CREAM, and of a richer quality.
3. GLACIALINE IS HARMLESS.—See Scientific Reports, the Opinions of the Press, and the Medical Faculty.
4. IT IS NOT AN ADULTERATION.—Read Prospectus. It is supported by Sanitary Authorities and Medical Evidence.
5. GLACIALINE HAS AN ESTABLISHED REPUTATION.—Read Testimonials. It is used in Hospitals, Asylums, Hotels, and Ships.
6. GLACIALINE IS USED LARGELY ABROAD.—It is also held in great esteem by some of the best Dairy Firms in London, and Provincial Cities and Towns of Great Britain.
7. BUTTER made with Milk or Cream preserved by the agency of GLACIALINE will be proved much finer in quality, having a richer tint and flavour, owing to the greater quantity of oil globules separated.
8. BUTTER made with Glacialined Milk or Cream is much FIRMER in consistence than Butter made in the ordinary way; also it is protected from the disagreeable flavour of TURNIPS or CABBAGES found in Butter made from Milk or Cream obtained from Cows fed on those articles.
9. EGGS may be KEPT PERFECTLY SWEET AND FRESH FOR OVER A YEAR!—Read *Testimonials.*
10. MEAT, FISH, POULTRY, RABBITS, &c., can be kept perfectly fresh and sweet without salting, even in the hottest weather.

All these statements are borne out by unimpeachable testimonials (and any one who chooses can prove their veracity by a single trial, as a sample packet is given gratis), therefore the Farmer and Dairyman will readily perceive that Glacialine is a great boon to them, and supplies a much felt need. The only precautions necessary are—the Food, whether solid or fluid, must be perfectly Sweet and Sound when the Glacialine is applied. The full quantity must be used according to the Directions on the Packet. If these rules are carried out, we guarantee its success. IT HAS NEVER FAILED.

Sole Manufacturers and Patentees—

THE ANTITROPIC CO., 126 Renfield Street, Glasgow.

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Messrs PRYCE & HARRIS, Craven Yard, Drury Lane, W.C.
Mr F. J. BUNKER, 40 Mildmay Grove, Mildmay Park, Islington, N.

Agents for Manchester—
Mr J. LONGDEN, 15 Cornbrook Street, Chorlton Road.
Mr W. LOWCOCK, 1 Hayfield Terrace, Florin Street, Pendleton.

Agent for Cheshire—
Mr W. HORNER, Cream Cheese and Clotted Cream Manufactory, Weaverham, near Northwich.
AGENTS ALSO IN ABERDEEN, EDINBURGH, DUMFRIES, BIRMINGHAM, BRISTOL, BRIGHTON &c., &c.

As several good Dairy and Agricultural Districts are unrepresented, reliable men, with a good connexion, are invited to apply for Agency. Suitable men will find this a valuable addition to their business.
Address to the Head Office, 126 Renfield Street, Glasgow.

Dairy and Dairy Appliances.

[Specially written for THE FARMERS' AND GARDENERS' ALMANACK.]

THE latest official report of the Board of Trade tells us this with reference to butter and cheese, and to commodities which we shall class under the head of Dairy Produce. Up to the end of October last year we had imported butter the estimated value of which was £8,530,569 ; and cheese to the value of £4,288,263 ; making a total of £12,818,832. Well, in last year's ALMANACK we ventured to hope that, our country being well adapted for dairying, farmers would speedily reduce the amount we paid to foreigners, and keep the money in their own pockets. We were disposed to this belief the more owing to the fact that we had the British Dairy Farmers' Association in existence, and through its influence we did not doubt but that we should see a reduction in the figures this year. Such, however, is not the case. In 1877 the conjoined value of butter and cheese in the ten months ending October was £12,245,277, or £573,555 less than in 1878. So that actually, with all our efforts to improve dairy-farming, to prove, through the British Dairy Farmers' Association, to owners of milch cows the advantage of making good butter and cheese on a more extensive scale, and therefore a more profitable one, than they have hitherto done, we have sadly to record an excess of outlay in the ten months of more than half a million pounds sterling. With regard to poultry, which aptly enough comes under the dairy, we notice that our imports have increased in the ten months slightly in value from £2,141,991 in 1877 to £2,144,330 in 1878. Cheese and butter and eggs would decidedly not be required in such large quantities from over the seas were our pasture lands well looked after, and our corn fields cultivated as they ought to be. But before this can be done farmers must have better security of tenure and more capital than many of them at present possess.

Before we total up the sum that, in our view, ought to belong to the dairy farmers of this country, instead of their American and Continental brethren, we shall just include swine, which can well be brought up on the refuse of the dairy. Up to the end of October 1877 the amount paid for pigs was only £83,142, and in 1878, in the corresponding term, the estimated value was £192,102. We set it down, therefore, that £15,153,264 has been half lost to the dairy farmers of this country through their indifference to that branch of husbandry which would pay them best.

The exports of butter and cheese are scarcely worth recording. They are growing smaller by degrees and beautifully less. In 1877, up to the end of October, the aggregate value of both was £291,812 ; in the corresponding period of 1878 it was only £244,478.

Butter and cheese cannot be properly made without good dairy utensils. We describe some of the very best in the following pages :—

MESSRS THOMAS BRADFORD & CO.'S CHURNS.

Twenty-five years of continued attention have enabled Messrs Bradford & Co., London and Manchester, to produce a churn so meritorious that it has found many imitators. There is no greater tribute to its worth, just as a counterfeit sovereign testifies to the value of the original ; but it is rather hard on the inventor, nevertheless, to see his ideas copied by others without any acknowledgment or without profit. However, we suppose that Messrs Bradford & Co. must just grin and bear it. The "Midfeather" dairy churn is one of the handiest to be had, and one that leaves the milk without a particle of caseine. At the London Dairy Show, 1878, after three days' consecutive churning under the eyes of practical men, it was awarded the first and only prize of £10, and a silver medal to boot. The Midfeather churn, which we illustrate (fig. 1), is commendable for its strength and lightness, for the hardness of the wood of which the frame is constructed, for its ease in working, and convenience of emptying both the butter and butter-milk into a tub underneath. This churn has recently had added angular breakers, which, conjoined with the Midfeather dash, produces remarkably successful churning agitation with slight expenditure of power. It is one of the best revolving hand barrel-churns that we know. As a churn for either horse gear or steam

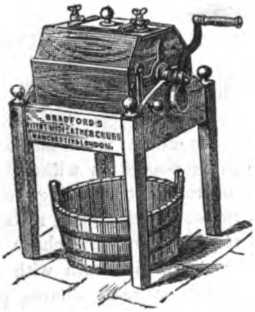


Fig. 1.—Messrs Bradford & Co.'s "Midfeather" Churn.

power, Messrs Bradford & Co.'s Midfeather is unexcelled.

MESSRS THOMAS & TAYLOR'S CHURNS.

Messrs Thomas & Taylor, of Stockport and Manchester, have long been famous for their churns. Their construction is upon scientific principles, and the result, of course, is the production of quantity and quality in butter at the smallest expenditure of power. In Messrs Thomas & Taylor's churns the agitation of the cream is produced, not by beaters alone, but by the rising and falling of the eccentric motion of the box against the sides of which the cream is forced. The judges of the R.A.S.E., at Bristol, 1878, after careful inspection and actual trials, gave Messrs Thomas & Taylor the £10 award. We give an illustration (fig. 2) of this capital self-acting churn ventilator. The ventilator lets out the air or admits it while the churn is in motion. Hot and cold water can be poured in without stoppage, and the progress of the butter-making be seen. This ventilator is perfectly self-acting, no spring nor any valve being required; and the churn combines the advantages of an open-air churn with all those that the revolving and enclosed churns possess. The ventilator is specially useful for churns worked by power.

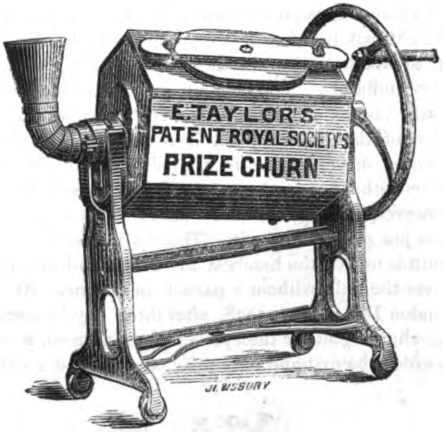


Fig. 2.—Messrs Thomas & Taylor's Churn Ventilator.

MR HATHAWAY'S BARREL CHURNS.

For many years Mr George Hathaway, of Chippenham, Wilts, has given very great attention to the manufacture of barrel churns. His efforts to extract every particle of butter from the milk have been attended with success. The butter milk, when it comes out of this machine, has no part of the valuable caseine left in it. The churn effectually robs the milk of every particle of its solid products, and this it does by beaters formed on the Archimedean principle, which gives increased agitation to the cream in churning, and produces a larger quantity of butter than can be obtained by other means. The stopper is a convenient and thoroughly water-tight fastener. Mr Hathaway has recently added a metallic mouth, which is certainly an improvement, as it prevents the wood-work from swelling. The cream is readily put into the churn, and the butter as easily taken out. The churn is well made, out of the best materials; and a great saving of labour is effected by the use of anti-friction rollers, upon which the churn is made to revolve, and no friction from iron and brass in the interior is permitted to taint the butter. The merits of Mr Hathaway's churn have been recognized by the Royal of England and other agricultural societies in competitive trials, and it has been found to work admirably well on dairy farms. At the British Dairy Farmers' Show, at the Agricultural Hall, London, in 1878, Mr Hathaway's steam-power churn was much admired. It was fitted with new adjusting dashes and self-acting valve; new gun-metal bushed roller, bearings, safety bolt, &c., and was adjudged at that Show a silver medal. We give an engraving of the Royal Agricultural Society's prize hand barrel churn (fig. 3).

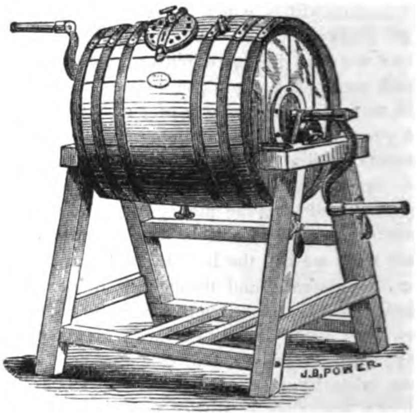


Fig. 3.—Mr Hathaway's Improved Barrel Churn.

MR W. WAIDE'S CHURNS.

After thirty years' trial, the churns manufactured by Mr W. Waide, Leeds, have been proved very satisfactory to all who have used them. Judges have differed considerably about churns at various shows, chopping about in a manner that is sometimes surprising. Some of the important features in these churns are that they revolve upon acti-friction wheels, have an air-discharge valve, and a catch to hold the churn firm while the cream is being poured into it, and also while the butter is taken out. The best materials, both in wood and iron, are used, the workmanship cannot be surpassed, and all the churns sent from this manufactory are equal to those exhibited at the shows. They are equally adapted for churning milk as well as cream; and altogether Mr W. Waide's churns are good ones.

MESSRS CARSON & TOONE'S PRIZE CHEESE PRESSES.

It may safely be set down as an axiom that you cannot have a good cheese if you have not a good press. Your dairymaid may struggle as she pleases, but without the essential pressure upon the curd you cannot get the cheese into proper form and texture. Messrs Carson & Toone, Warminster, Wilts, make cheese presses of eight different sizes and descriptions, suitable for all dairies. These presses are light and strong, and easily movable from place to place in the dairy as may be requisite; and in these days, when space means money, even on farm steadings, Messrs Carson & Toone's presses supply a great desideratum, from the fact that they require but little room. There is little labour attending their management. By merely turning the screws the weights are raised, and the pressure is then continuous, and diminishes not as the cheese sinks by compression. Messrs Carson & Toone supply four different weights suitable to the varying condition of the cheese. These presses are to be recommended to the attention of dairymen as good practical articles.

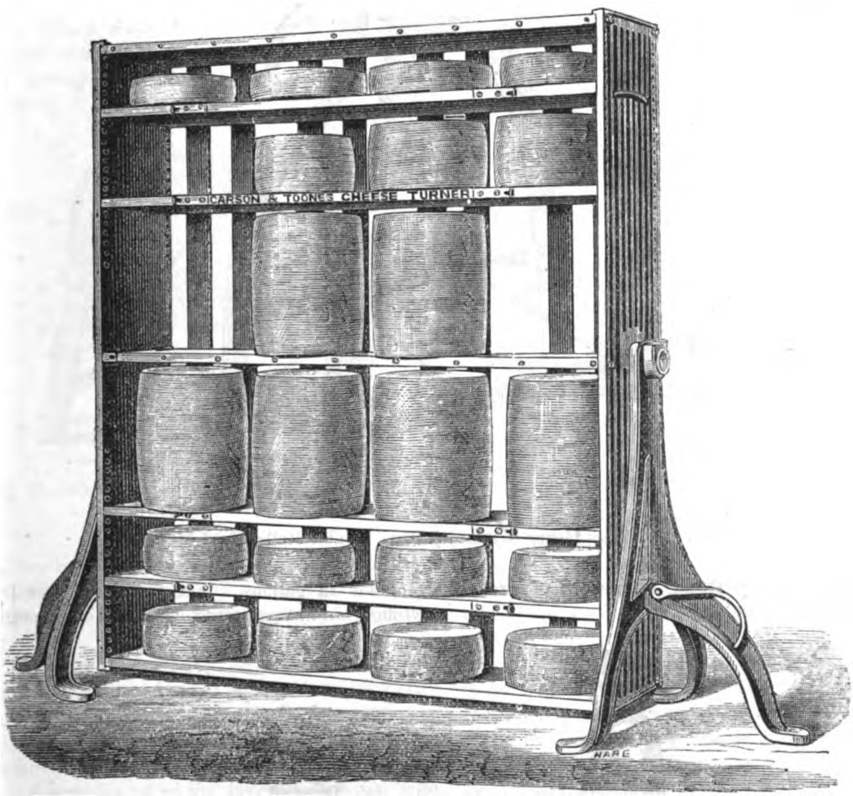


Fig. 4.—Messrs Carson & Toone's Prize Cheese Turner.

The cheese turner, manufactured by Messrs Carson & Toone, is an invention not to be lost sight of by those who dwell in regions "with daisies pied," as the old poet has it. The judges of the Royal Agricultural Society of England thought so much of the contrivance at Bristol in 1878, that they gave it the £10 prize. (See fig. 4.)

MESSRS HENRY BAMFORD & SONS' CURD MILL.

Messrs Henry Bamford & Sons, Uttoxeter, Staffordshire, manufacture excellent machinery. The material is well and wisely chosen, to start with; and the workmanship is accompanied with skill. Messrs Bamford & Sons have long devoted special attention to the manufacture of cheese presses, and more particularly to curd mills, in the making of which they stand unsurpassed. Their double roller curd mill attracted the attention of the judges of the Royal Agricultural Society at Bristol last year, and received in competition the only prize of £5. It is a valuable machine, made of iron, easy of working, and effectual in grinding—a great improvement upon similar utensils made of wood. The working part of this mill consists of double-spiked rollers, which are all galvanized, and are thus easy of cleaning, and durable. The mill is fitted with a double block-tin hopper, and mounted on a light, neat, and strong framework of wrought iron. See illustration (fig. 5).

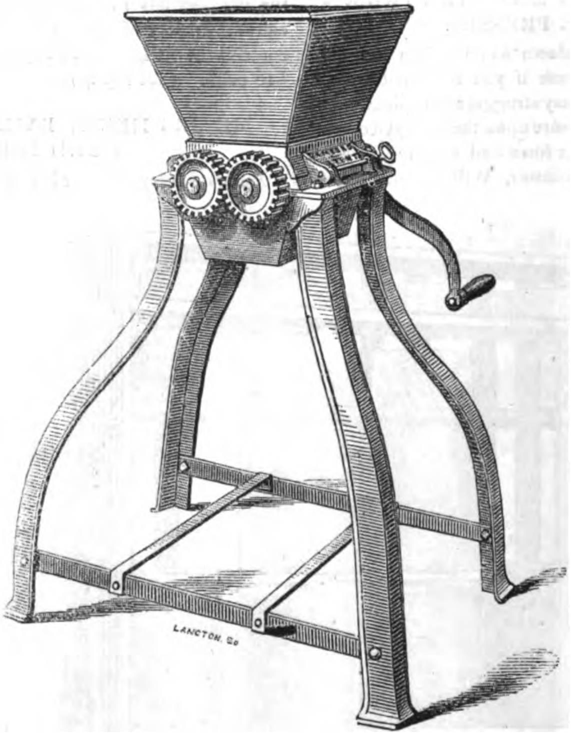


Fig. 5.—Messrs Henry Bamford & Sons' Double Roller Curd Mill.

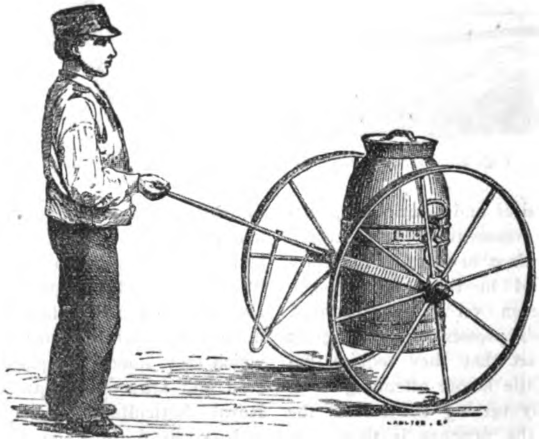


Fig. 6 —Messrs Vipan & Headly's Milk Can and Carriage.

MESSRS VIPAN & HEADLY'S MILK CANS AND CARRIAGES.

Messrs Vipan & Headly, Leicester, manufacture a convenient milk can on carriage to be easily hauled by a boy. The can and carriage we represent (fig. 5) holds 14 gallons. The carriage is one piece of wrought iron, very strong, mounted on wrought-iron wheels, so constructed that the vessel can be instantly raised on, or lowered from, the axle of the carriage by the person using it without any assistance, and is equally adapted for the town pavement or for country use. All Messrs Vipan & Headly's cans are now made of strong tin, planished, and not painted. These cans received a high commendation at the Royal Agricultural Society's Show at Bristol, 1878.

MESSRS ROBINSON & RICHARDSON'S BARREL CHURNS.

The barrel churns of Messrs Robinson & Richardson, Kendal, are thoroughly well made, of the best materials. The outside of the churn barrel is French polished, which makes it very easy to keep clean. The special advantage claimed for these churns is the peculiar arrangement of the beaters, which, instead of consisting of one solid piece fixed to the side of the churn, are built up of separate pieces, the cross pieces being let into an upright; and the sides of the churn are quite firm. The upright forms a stay for the side of the churn. These beaters insure the cream or milk being properly churned, and when the butter comes, they gather it into solid pieces separate from the butter milk, and the dairymaid, owing to the construction of the beaters, can readily bring it all close to the bung for removal from the churn. The bungs used are what is commonly called the inside bung, fitted with an improved india-rubber flange, and an improved outside bung fastened by a cam, without screws and other complications. Messrs Robinson & Richardson's churns run on anti-friction rollers, and are fitted with spring vent plugs and all the latest improvements. (Fig 7.)

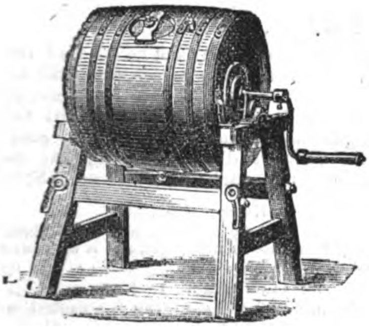


Fig. 7.—Messrs Robinson & Richardson's Barrel Churn.

THE ANTITROPIC CO.'S GLACIALINE SALT.

This salt, manufactured at 126 Renfield Street, Glasgow, is highly recommended by the Faculty and by practical dairymen. It is attested by those who have extensively used it in their own dairies that, in the hottest of weather, it preserves milk and cream from spoiling. We have experimented with glacialine ourselves, and are quite satisfied with its effects, and believe it will be a great boon to dairy farmers and milk vendors. Residents amongst the fields, yet dependent on their neighbours' cows for their household milk, often, like ourselves, in hot weather, find even the morning's supply "turned" and useless for the evening cup of tea. With glacialine we shall now feel independent of thunder-storms and canned milk. Further, we would draw attention to the valuable opinion of Dr Yellowlees, of the Royal Asylum, Gartnavel, Glasgow. He says in his report:—"I have carefully tried the new preservative, called glacialine, and did so at first in a very sceptical spirit. At the end of summer it was used daily in the Asylum to preserve milk from becoming sour, for which it proved perfectly effectual, without altering the taste of the milk in the slightest degree. From what I have ascertained of its composition and effects, I am satisfied that glacialine contains nothing injurious to health. The testimony of other medical men who have tried it confirms my opinion, and I have no hesitation in testifying that this substance possesses very valuable preservative properties, and that it may be used with perfect safety." The French journal, the *Cultivator*, on the 26th October last, says:—"We feel we shall render real service to all concerned in recording the complete success of one trial that has fully convinced ourselves by the results. We placed milk and cream fresh from the cow, on the 14th October, in four separate pans. Into two we put a spoonful of glacialine, leaving the other two to natural causes. Now, in ten days after, when time had been fully allowed to test the experiment, we found both the milk and cream treated with glacialine as fresh as on the first day, whilst, it is needless to say, the other milk and cream was in a complete state of decomposition. These great results, which all the visitors to the department of dairy products (at the Paris Exhibition, 1878) could see for themselves, satisfied us that when glacialine becomes generally known throughout France, it will be of universal service in the dairy farms and in private families, especially in the summer season.'

PRICE ONE SHILLING, POST-FREE FOR 1s. 2d. IN STAMPS.

THE

VILLA GARDENER'S MANUAL

AND

AMATEUR'S YEAR BOOK

For 1878-79.

PROFUSELY ILLUSTRATED.

EDITED BY WILLIAM EARLEY, ILFORD.

OPINIONS OF THE PRESS.

In the *Villa Gardener's Manual* people who are fond of gardening as a means of health and recreation, and are fortunate enough to possess the means of indulging this taste in the shape of a garden, will find a safe and informatory guide as to the best way of laying out their little domain, and as to the proper treatment of plants, vegetables, and fruit trees at all seasons of the year. The book includes a number of useful tables and memoranda, a general treatise on "Gardening for Beginners," a garden Calendar for each month, and a series of short articles, under the title "Villa Garden Requirements." Cheap and well arranged, this manual is exceedingly well adapted to meet the requirements it is intended to supply.—*Scotsman*, June 20, 1878.

BATH CHRONICLE.

The *Villa Gardener's Manual* is a volume brimful of information on matters connected with horticulture, written so that it may be thoroughly understood by the novice.

NORWICH MERCURY.

The *Villa Gardener's Manual* is a most useful manual for the villa resident. Its cost—one shilling—is small, when the wealth of information given is considered. In its pages are to be found most instructive, popularly written papers on the many branches of the gardener's art, which it is desirable should be known by a man having a good garden well stocked with fruit trees, or by a well-filled window or balcony of flowers.

CHELMSFORD CHRONICLE, April 26, 1878.

This is a book which has long been wanted, and Mr Earley has proved himself well capable of supplying the want.

GARDENERS' MAGAZINE, May 4.

The *Villa Gardener's Manual* contains a vast mass of useful information on the making and managing of gardens, a copious garden calendar, and a number of well-written essays on garden work.

ELGIN COURANT, May 3, 1878.

A publication that is bulky, showy, and very cheap. We have seldom seen a book more likely to be useful in its own way.

PRESTON CHRONICLE, May 4, 1878.

This manual is a very practical publication.

LEICESTER JOURNAL, May 3, 1878.

This manual will be found useful, especially to amateur gardeners. It gives a calendar starting from the present month, tables of weights and measures, papers on gardening for beginners, instructing in digging, planting, seed sowing, propagation by cuttings, nursing, potting, thinning, staking, and training, summer pruning, draining, stoking, &c.; a full monthly calendar of operations, a description of villa garden requirements, and particulars of a number of nurserymen's novelties.

READING MERCURY, May 4, 1878.

This manual contains a series of chapters on "Gardening for Beginners," in which the elementary facts of horticulture are taught. There is a useful garden calendar for each month, and several chapters (illustrated) on "Nurserymen's Novelties" and "Villa Garden Requirements."

KELSO CHRONICLE.

This manual is carefully compiled, and exhaustive. It consists of 192 large, double-column pages, and is well printed, and is an excellent shilling's worth.

BERROW'S WORCESTER JOURNAL.

The *Villa Gardener's Manual.*—This is a capital, well-compiled handybook for those who have a small garden. The information it affords is practical and useful.

ESSEX HERALD, April 23, 1878.

The chapter on "Gardening for Beginners" is the special feature of the manual before us, though we are not unmindful of the other valuable chapters.

NORTH BRITISH AGRICULTURIST, May 8, 1878.

The amateur and professional gardener will find in this manual many useful hints in the cultivation and management of garden produce. The monthly calendars contain a large amount of practical advice, while a number of tables and memoranda add materially to the usefulness of the manual.

FOUNTAIN, April 25, 1878.

The reading of this treatise has given us much pleasure. The suggestions for amateurs are especially valuable. Instructions are given for doing almost everything that requires to be done in a villa garden.

THE WESTERN TIMES, April 23, 1878.

"The Monthly Calendar for the Garden" is a perfect cyclopædia of reference for all the operations in kitchen, fruit, and flower gardens; pits and frames, glass-house, vinery, and orchard-house.

THE BRITISH MAIL, May 1, 1878.

We are glad to be able to commend the *Villa Gardener's Manual*, as especially suited to the need of the man with a small garden, and for the very large number of people in and around every great town who have little gardens of their own, and wish to know how to make the best of them.

BEDFORD TIMES, May 18, 1878.

The *Villa Gardener's Manual* is a capital serial for *bona fide* garden amateurs, and for lady amateurs in particular, containg numerous subdivision on gardening for beginners, a monthly garden calendar, and to end with, "The Villa Housekeeper's Note Book," containing cookery receipts, &c. The book is interestingly illustrated.

"VILLA GARDENER" OFFICE, SALISBURY SQUARE, LONDON, E.C.
SIMPKIN, MARSHALL & CO., STATIONERS' HALL COURT, LONDON.
JOHN MENZIES & CO., EDINBURGH. W. H. SMITH & SON, DUBLIN.

New and Rare Plants.

Messrs SUTTON & SONS, Reading.

Messrs Sutton & Sons, the Queen's Seedsmen, Reading, while looking anxiously after all that is novel, are careful to conserve all old good things. There is in these days too much striving after "a new thing," and many, for novelty's sake, grasp at the shadow, like the dog in the fable, only to lose the substance. Novelty *per se* is, what some clever writer has called it, "the fancy of fools;" wisdom rests with those who manufacture the articles, or cultivate the seeds and roots, experience has taught them are good.

GREEN GLAZED AMERICAN CABBAGE.

This is a novel and distinct variety; the leaves are of a bright shining green, and retain their colour when cooked.

SUTTONS' EARLY DWARF BROWN FORCING CABBAGE LETTUCE.

This is first-rate for early forcing. It is remarkably compact, has few outer leaves, and is very crisp and sweet. (Fig 1.)

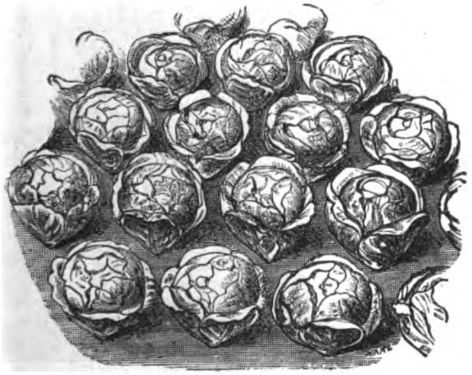


Fig. 1.—Suttons' Dwarf Forcing Cabbage Lettuce.

SUTTONS' PRINCE LEOPOLD PEA.

A medium wrinkled Pea. It is less affected by drought and mildew than any other Pea. At Messrs Suttons' trial farm, while others were quite parched up, this was growing luxuriantly. The pods are produced in pairs, which almost cover the haulm. It is of excellent quality, and comes to table a beautiful green colour. Height, 4 feet.

SUTTONS' NEW FRINGED CABBAGE LETTUCE.

This is a useful and ornamental Lettuce. The leaves are finely fringed. The habit is close and compact, it has a fine firm heart, and does not run quickly to seed. It is useful for garnishing. (Fig 2.)

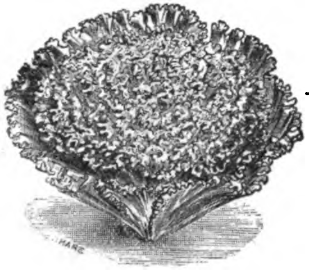


Fig. 2.—Suttons' New Fringed Cabbage Lettuce.

HARDWICKE HYBRID MELON.

This fine green-fleshed Melon (offered by Messrs Sutton for the first time) was raised by that well-known horticulturist, Mr D. T. Fish, who has placed the entire stock in their hands. It combines the highest qualities of Queen Emma and Messrs Suttons' Royal Horticultural Prize. It has a robust constitution, and will produce two good crops from the same plants in one year. Each fruit varies from 3 lb. to 5 lb. in weight, and are of dark green colour, slightly netted. The flesh is pale green, and of delicious flavour.

NEW TURKISH VEGETABLE MARROW.

A useful variety. If cooked when young, the flavour is very agreeable, and the ripe fruit makes excellent marmalade.

SUTTONS' SNOWBALL TURNIP.

This beautiful early variety is the best garden Turnip in cultivation; of fine shape, remarkably mild flavour, and very solid. The flesh is white as snow.

THE PETROWSKI EARLY ROUND YELLOW TURNIP.

A valuable and distinct yellow variety, introduced by Messrs Sutton from Germany. In shape it is similar to the Egyptian Turnip-rooted Beet. Flesh close grained, of remarkably fine flavour.

SUTTONS' NEW LATE QUEEN BROCCOLI.

Messrs Sutton & Sons have found out that their new late Queen Broccoli is one of the best and latest that has been grown. It fills up the gap which previously existed between the late Broccolis and Cauliflowers, and is therefore invaluable. At Messrs Suttons' trial farm last summer they were cutting splendid heads at the end of June. Late Queen is perfectly distinct from all other Broccolis, very dwarf and compact in growth, and rarely affected by frost. The heads are well protected, of medium size, handsome and of creamy white colour. (Fig 3.)

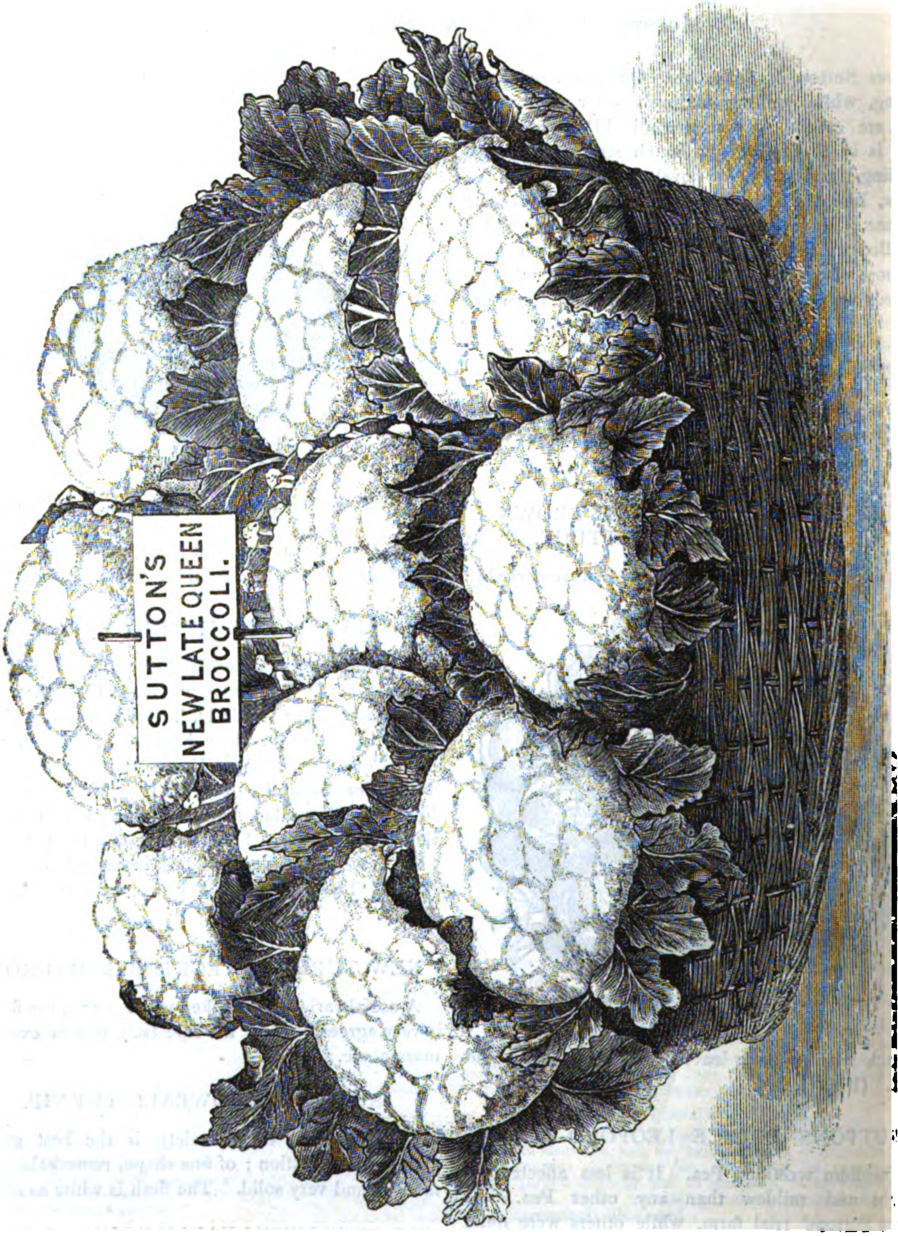


Fig. 3.—Suttons' New Late Queen Broccoli.

NEW RHUBARB—"THE READING RUBY."

This is a very excellent novelty, and a valuable and distinct variety. Last season it was thoroughly tested, and for robustness, flavour, and appearance, it is unrivalled. The stalks are of a brilliant ruby crimson outside, and this colour extends throughout the interior of the stem, producing, when cooked, a deep cherry-coloured juice of delicious flavour. "The Reading Ruby" is earlier than any other variety, and last year, with only a slight protection of leaves and dry litter, it was ready to pull early in February. (Fig. 4.)

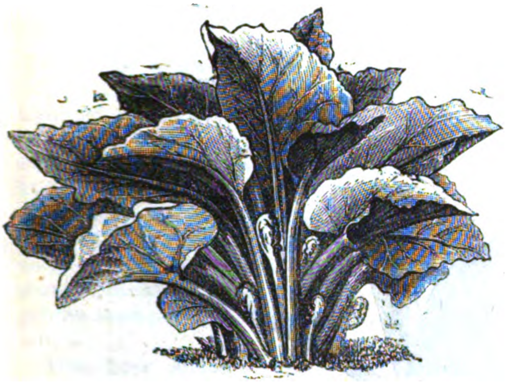


Fig. 4.—New Rhubarb "The Reading Ruby."

SUTTONS' ROYAL CLUSTER TOMATO.

This is a novel and distinct variety raised by crossing Red Currant and Excelsior. It produces enormous bunches of fruit in clusters, three times larger than Red Currant, while it is more hardy and robust than the Red Currant, and more ornamental.

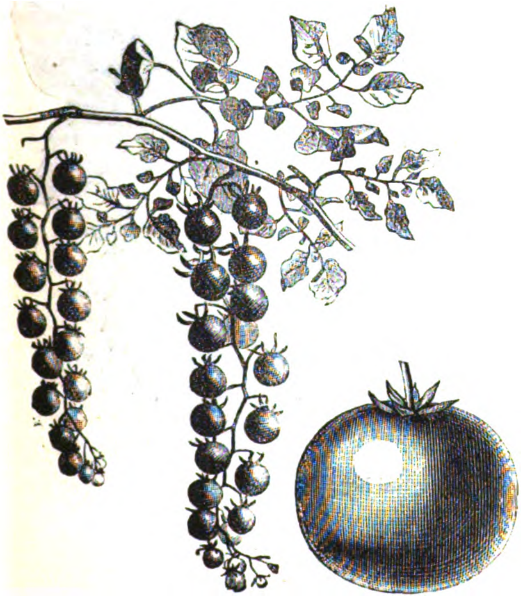


Fig. 5.—Suttons' Cluster Tomato. Natural Size.

SUTTONS' NEW STRAIN OF CRASSIFOLIA GLOXINIA GIGANTEA.

This new strain, which Messrs Sutton have supplied to their customers for the last two years, has given universal satisfaction. Their houses were visited during the flowering period by many experienced Gloxinia growers, who greatly admired the size of the flowers, and the richness of their colours. The flowers are extremely beautiful, and more than twice the size of the ordinary Gloxinias. The leaves are so reflexed as to completely hide the pot, thus rendering this strain peculiarly adapted for table decoration. (Fig. 6.)

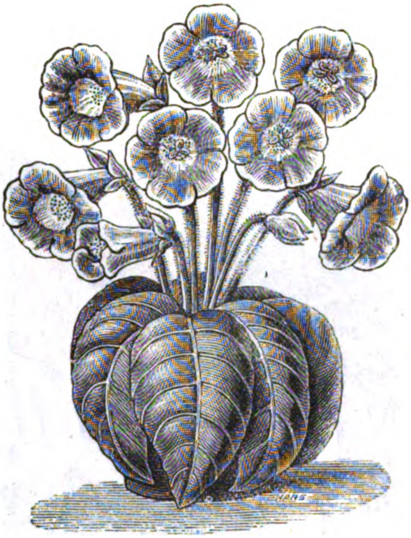


Fig. 6.—Suttons' New Gloxinia Crassifolia gigantea.

NEW DIAMOND MIGNONETTE.

This is a fine variety. The flowers are white, produced in very compact pyramid form. The plant is sure to become a favourite.

SUTTONS' PHLOX DRUMMONDII VICTORIA.

This plant is compact in habit, is of globular shape, about 1 foot high, and completely studded with flowers.

SUTTONS' LITTLE WONDER CALCEOLARIA.

This new strain of Calceolaria is a valuable addition to the list of florists' flowers. The plants are only from 8 to 10 inches high, and the flowers are as large and finely marked as those produced by Messrs Suttons' strain "Perfection."

SUTTONS' NEW DOUBLE HYBRID BEGONIA.

This is a valuable class of robust, tuberous rooted plants, of very compact habit. The flowers are very large, and of the finest shades of colour. (Fig. 7.)

SUTTONS' DOUBLE CINERARIA.

This is really a beautiful flowering, and an improvement on most of the double Cineraria that have hitherto been offered to the public. We commend this plant to our readers' notice.

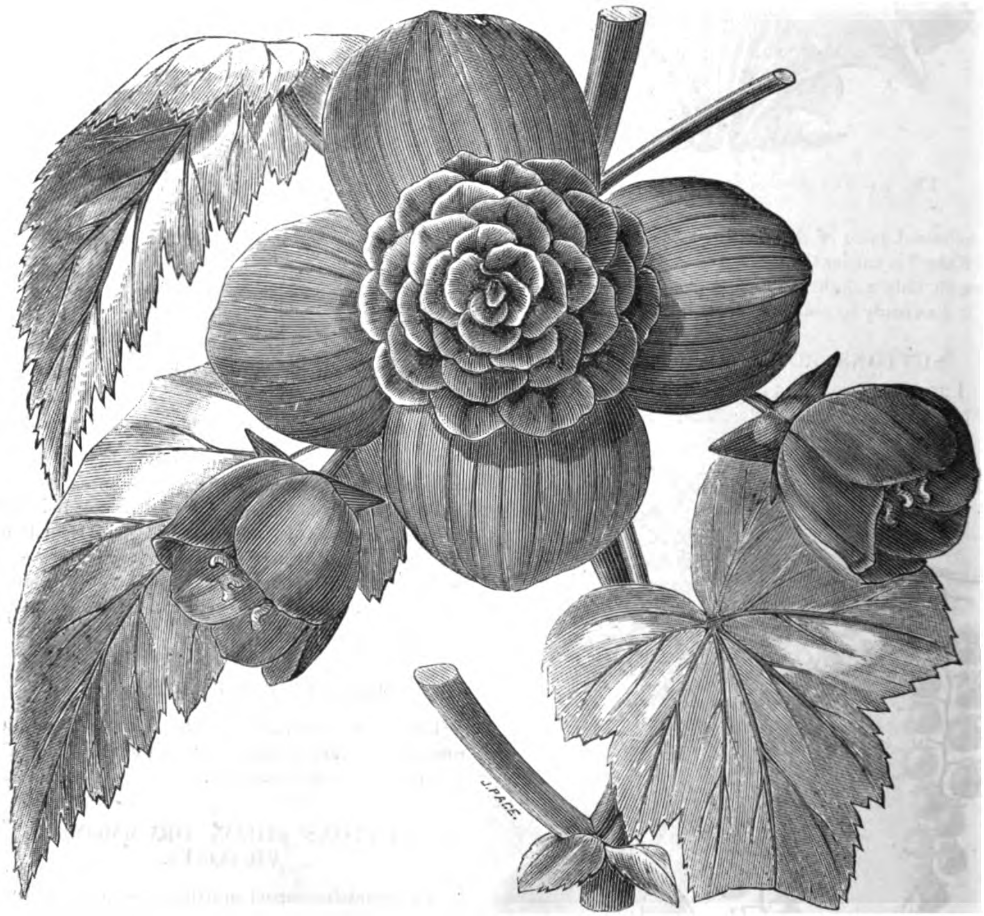


Fig. 7.—Suttons' New Double Hybrid Begonia.

MESSRS CARTER & CO., High Holborn, London.

IT is not often given to every firm the faculty of taking away five gold medals at an International Exhibition. This the firm of Messrs Carter & Co. succeeded in doing at the Paris Show last year. They were awarded a gold medal for the best models of all kinds of roots, and for collection of seeds; for flowers and ornamental plants they received another; for vegetables also; likewise for forest plants and seeds; and, in addition, in the section for cereals, we should mention, they succeeded in securing the golden stamped coin displaying the worth of their exhibits.

This year Messrs Carter & Co. give out their "Little Wonder Pea," which is reported a good sort. It is dwarf in habit, heavy in bearing, and the pods contain from seven to eight Peas each.

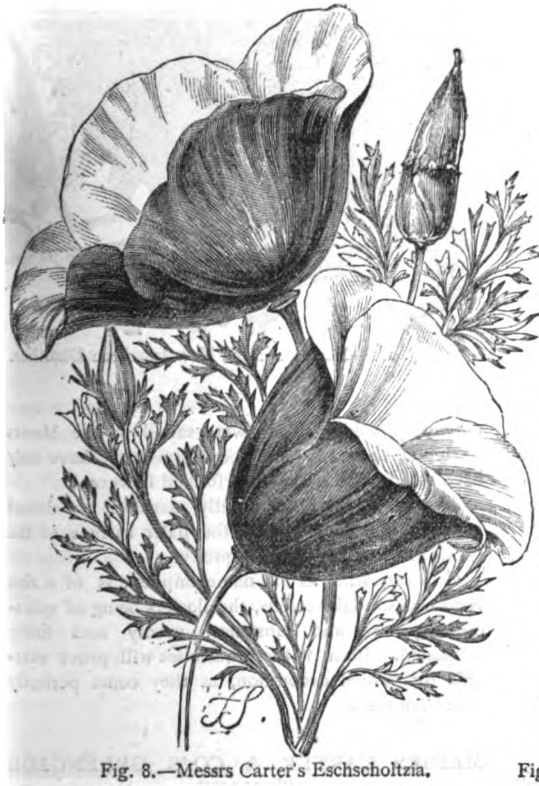


Fig. 8.—Messrs Carter's Eschscholtzia.

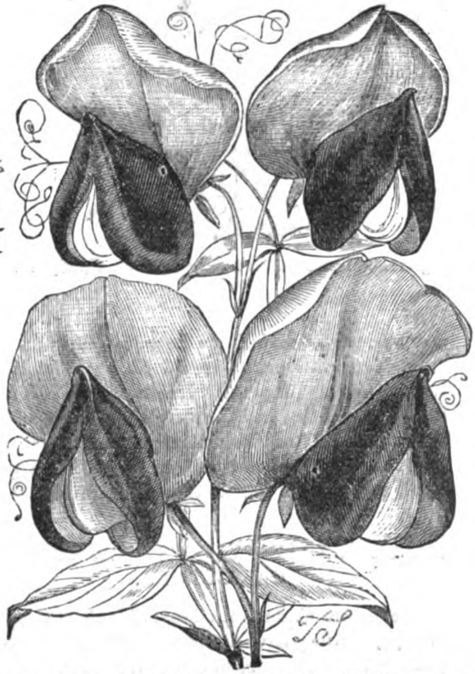


Fig. 10.—Messrs Carter's New Sweet Pea (Violet Queen).

MESSRS CARTER & CO.'S ESCHSCHOLTZIA.

Messrs Carter & Co. also send out their new Eschscholtzia, a very pretty annual, the production of years of careful selection. The inner side of the petals is of a rich orange colour, the outer side being brilliant scarlet, with a rich silky appearance. The flowers are of good substance. (Fig. 8.)

MESSRS CARTER'S CREAM PINE APPLE.

This Melon we illustrate (fig. 9) for the distinctness and symmetry of its form. It has quality about it, and flavour of a delicious character. It was awarded a first-class certificate at the Royal Horticultural Society.

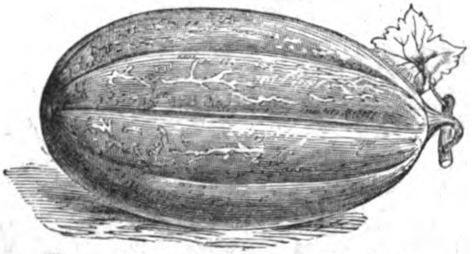


Fig. 9.—Messrs Carter's Cream Pine Apple.

MESSRS CARTER & CO.'S NEW SWEET PEA (VIOLET QUEEN).

It is now several years since any novel form of this popular flower has been introduced, and the variety now offered will, we feel sure, be universally welcomed. It originated at Messrs Carter & Co.'s seed farms, and is a good one. (Fig. 10.) It is dwarfer in habit than the other varieties, and the seed is also quite distinct in appearance, the flowers ranging in colour from deep mauve of the keel to light violet of the guard petal, suggestive of the beautiful Bougainvillea.

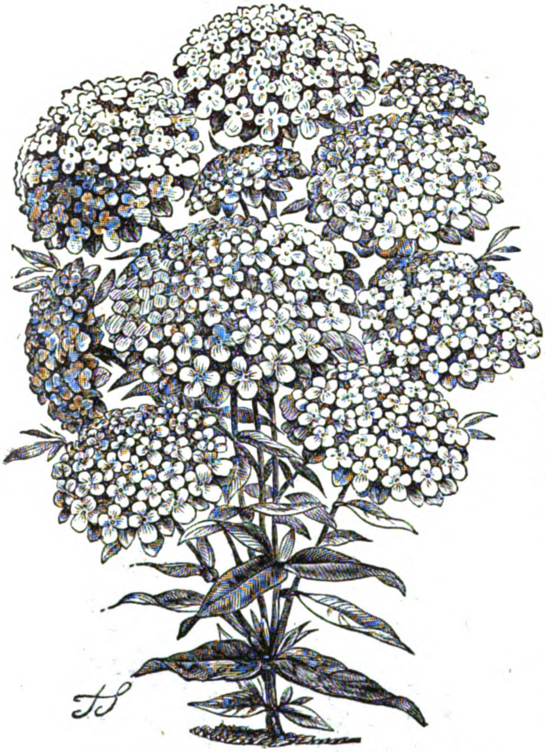


Fig. 11.—Messrs Carter's New Carmine Candytuft.

MESSRS CARTER & CO.'S NEW CARMINE CANDYTUFT.

The Messrs Carter introduced this charming plant in 1874, but they have not been able to offer it to the public until last season, in consequence of a failure of the crop. It is of a dwarf compact habit, very distinct, and presents one mass of vivid carmine bloom. Should the plant flower freely, and be of good habit, it will prove a valuable acquisition for garden decoration in spring and early summer—a time when good plants are much wanted.

MESSRS CARTER & CO.'S NEW JAPANESE DIANTHUS (EASTERN QUEEN AND CRIMSON BELLE).

These beautiful forms of the popular D. Heddewigii are very pleasing. They were raised by the Messrs Carter at their St Osyth seed farms, and have only been selected from the finest formed flowers.

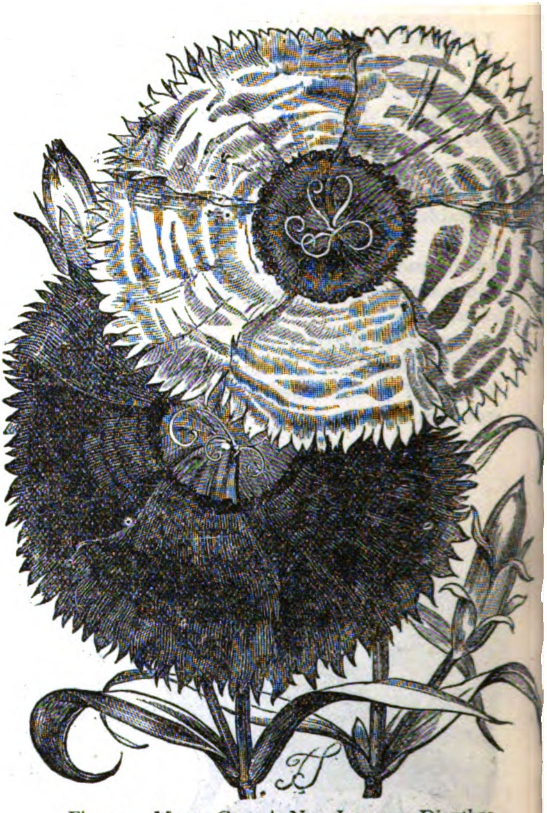


Fig. 12.—Messrs Carter's New Japanese Dianthus.

Eastern Queen is beautifully marbled, the broad bands of rich mauve upon the paler surface of the petals are very striking and pretty.

Crimson Belle, as its name implies; is of a rich vivid crimson-lake colour, the flowers being of extraordinary size and substance, evenly and finely laciniated. Both of these varieties will prove valuable for garden decoration, as they come perfectly true from seed.

MESSRS CARTER & CO.'S GREENGAGE TOMATO.

This Tomato is a most valuable acquisition, the rich citron-coloured semi-transparent fruit so nearly representing Plums as to be frequently mistaken for the latter at the exhibitions. It is particularly early and prolific, and the deliciously piquant flavour, described as "a beautiful blending of the Apple and Tomato," has secured for it the most universal admiration. We may safely say that no previous introduction of the culinary vegetable section has ever earned such unanimous encomiums from Royal and other distinguished personages, in addition to the testimony of so many prominent horticultural authorities; and we feel sure this Tomato is now too well known and appreciated to require further recommendation. It may fairly claim to be the Greengage of Tomatoes—as the fruit known by the name is amongst Plums.

MESSRS CARTER & CO.'S (VICK'S) CRITERION TOMATO.

This Tomato is very robust in habit, of remarkably free setting and prolific bearing, and when ripe, the berries are of a pretty transparent cornelian-red shade of colour. The flavour is exquisite, and the huge clusters of bright-coloured fruit have a very attractive appearance upon the plant. It was raised by Mr Vick, one of the most eminent seedsmen in the United States, who has selected it for several years, and who now expresses the highest opinion of its superior excellence. (Fig. 13.)

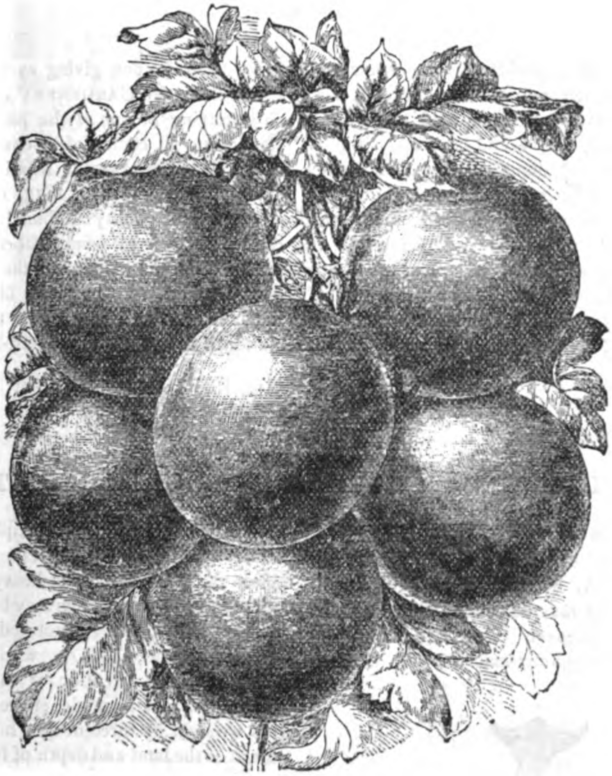


Fig. 13.—Messrs Carter's (Vick's) Criterion Tomato.

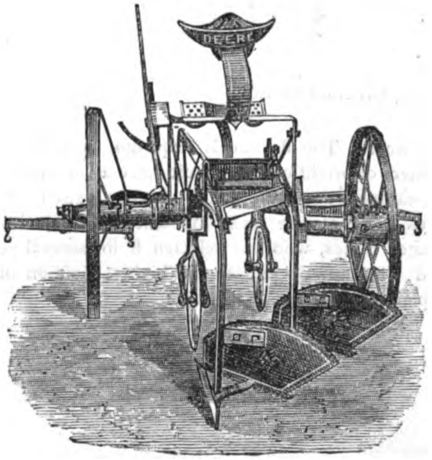
Our Frontispiece.

THE Longhorns are a breed that, in our estimation, has been neglected in this country of late years. Had they had the same attention paid to them as other breeds have had, they would have taken higher positions in all show-yards than they have done. They are not such stubborn feeders as many imagine; they are fair milkers, produce excellent flesh, and, above all, next to the Highlanders, they are picturesque in any nobleman's or gentleman's parks, and are docile withal. And they are not alone to "the manor born;" they are fitted for the fields of the farmer; and so much do we think of their qualities generally, that we have decided upon giving as a frontispiece to THE FARMERS' AND GARDENERS' ALMANACK, this year, an engraving of one of the handsomest of the breed. Conqueror 3d could not be overlooked by the judges of the Royal Shows, at Birmingham, at Liverpool, and at Bristol, in 1876, 1877, and 1878. His style, symmetry, and quality combined to pronounce him truly conqueror over all competitors. This noble animal was bred by, and belongs to, the Duke of Buckingham and Chandos, who has long taken great interest in the breed. We are indebted to Mr J. B. Lythall, Editor of the "Lorghorn Herd-book," for the cut.

IMPLEMENTS TOO LATE FOR CLASSIFICATION.

THE DEERE GANG PLOUGH.

WE have before us the specification, August 1864, of Mr A. B. Childs for a new ploughing machine, and what may be called the germ of the light gang iron plough, given below. We have been informed this first ploughing machine was tried at Bedford and rejected. This may easily be believed when one looks at the cumbrous and heavy wooden framework, and crank wheel and chains of the good but crude idea; but reference to the "Deere Gang Plough" shews the good principle retained, and lightness, strength, and compactness substituted, where before the framework was heavy and unhandy. The Deere gang plough, which may be considered a novelty in this country, is manufactured by "Deere" & Co., Moline, Illinois, U.S.A., whose models of implements attracted attention at the Paris International Exhibition. It is made entirely of iron and steel. It is wrought by three or four horses according to the nature of the land and depth of furrow required. The plough is actuated by one lever, which locks the ploughshares in the ground at any depth, and with a lug on the hub lifts the plough clear out of the land, so as to enable the implement to turn at the headlands without effort on the part of the driver. The tongue and clevis are attached to the beams by a swivel bolt, giving it a free vertical motion, which relieves the horses' necks of pressure and affords a natural draught from the end of the beams and the end of the tongue. The plough is simple in construction, it is strong and durable, and makes a straight furrow, no matter how rough and uneven the land may be. The Deere gang plough is very light of draught; and another important feature in connexion with it is that it cuts corn-stalks, thus saving the expense of one man. Of course this implement is chiefly designed for America, but it might be of use here. The seat on the plough takes away the notion of menial labour, as in other horse ploughs. A farmer or his son might sit and direct it as easily and comfortably as he could his trap—taking a plough-drive over his fields when he was in the humour, or had a ploughman on strike.



The Deere Gang Plough.

THE FARMER'S STABLE CARD.

FOR BREEDER'S NOTES—*(See other Side).*

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Day
1	W	S	S	Tu	Th	**S**	Tu	F	M	W	S	M	1
2	Th	**S**	**S**	W	F	M	W	S	Tu	Th	**S**	Tu	2
3	F	M	M	Th	S	Tu	Th	**S**	W	F	M	W	3
4	S	Tu	Tu	F	**S**	W	F	M	Th	S	Tu	Th	4
5	**S**	W	W	S	M	Th	S	Tu	F	**S**	W	F	5
6	M	Th	Th	**S**	Tu	F	**S**	W	S	M	Th	S	6
7	Tu	F	F	M	W	S	M	Th	**S**	Tu	F	**S**	7
8	W	S	S	Tu	Th	**S**	Tu	F	M	W	S	M	8
9	Th	**S**	**S**	W	F	M	W	S	Tu	Th	**S**	Tu	9
10	F	M	M	Th	S	Tu	Th	**S**	W	F	M	W	10
11	S	Tu	Tu	F	**S**	W	F	M	Th	S	Tu	Th	11
12	**S**	W	W	S	M	Th	S	Tu	F	**S**	W	F	12
13	M	Th	Th	**S**	Tu	F	**S**	W	S	M	Th	S	13
14	Tu	F	F	M	W	S	M	Th	**S**	Tu	F	**S**	14
15	W	S	S	Tu	Th	**S**	Tu	F	M	W	S	M	15
16	Th	**S**	**S**	W	F	M	W	S	Tu	Th	**S**	Tu	16
17	F	M	M	Th	S	Tu	Th	**S**	W	F	M	W	17
18	S	Tu	Tu	F	**S**	W	F	M	Th	S	Tu	Th	18
19	**S**	W	W	S	M	Th	S	Tu	F	**S**	W	F	19
20	M	Th	Th	**S**	Tu	F	**S**	W	S	M	Th	S	20
21	Tu	F	F	M	W	S	M	Th	**S**	Tu	F	**S**	21
22	W	S	S	Tu	Th	**S**	Tu	F	M	W	S	M	22
23	Th	**S**	**S**	W	F	M	W	S	Tu	Th	**S**	Tu	23
24	F	M	M	Th	S	Tu	Th	**S**	W	F	M	W	24
25	S	Tu	Tu	F	**S**	W	F	M	Th	S	Tu	Th	25
26	**S**	W	W	S	M	Th	S	Tu	F	**S**	W	F	26
27	M	Th	Th	**S**	Tu	F	**S**	W	S	M	Th	S	27
28	Tu	F	F	M	W	S	M	Th	**S**	Tu	F	**S**	28
29	W	—	S	Tu	Th	**S**	Tu	F	M	W	S	M	29
30	Th	—	**S**	W	F	M	W	S	Tu	Th	**S**	Tu	30
31	F	—	M	—	S	—	Th	**S**	—	F	—	W	31

THE FARMER'S STABLE CARD

AND BREEDER'S KALENDAR.

Date.	NAME OF ANIMAL.	Mare	Cow	Ewe	Sow	Bitch	Date

PERIOD OF GESTATION FOR ANIMALS.

Species.	Premature Labour.	Regular Time.	Protracted.
Mare	330 days	340 days	420 days.
Cow	240 ,,	285 ,,	330 ,,
Sheep and Goat	135 ,,	144 ,,	160 ,,
Sow	110 ,,	120 ,,	130 ,,
Bitch	55 ,,	60 ,,	70 ,,

For Dates, see Kalendar in *Farmers' and Gardeners' Almanack.*

JAMES GIBBS AND COMPANY,

SOLE MANUFACTURERS OF

GIBBS'

PURE FEEDING CAKE

The Best and Cheapest Cattle Food.

"A well-made, fresh, wholesome Feeding Cake, possessing high fattening qualities."—Dr AUGUSTUS VOELCKER.

"A valuable Feeding Cake—palatable and readily digestible. Can confidently recommend it to the stock feeder."—Dr CHARLES CAMERON.

"Rich in nitrogenous and carbonaceous principles of the best quality."—Professor SIBSON.

"Excellent quality of compound or mixed Feeding Cake."—Dr STEVENSON MACADAM.

FULL PARTICULARS ON APPLICATION.

HEAD OFFICES:
16 MARK LANE, LONDON, E.C.
Branch Offices—BRISTOL AND PLYMOUTH.
Mills—LIMEHOUSE, LONDON.

R. HORNSBY & SONS

INVITE THE ATTENTION OF

MERCHANTS, SHIPPERS, FARMERS, AND OTHERS

In all parts of the World, to the following Specialities of their manufacture, for every one of which they have received

THE FIRST PRIZES OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND,

In addition to Hundreds of HIGHEST HONOURS;

GOLD AND SILVER MEDALS, DIPLOMAS OF HONOUR,

and other Awards, from AGRICULTURAL SOCIETIES, and INTERNATIONAL EXHIBITIONS, throughout the United Kingdom, the Continents of Europe and America, and the Colonies.

STEAM ENGINES,

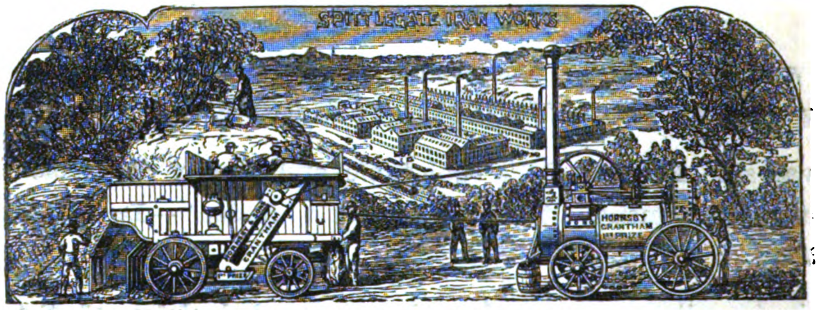
with Cylinders inside the Steam Chamber for entire prevention of condensation.

From 1848 to their last competition at the R.A.S.E. trials, they gained more First Prizes than any other Engines, being unequalled for economy in fuel, durability, and efficiency.

STEAM THRASHING MACHINERY,

specially noted for the perfection of each operation and the clean sample of Corn delivered ready for market.

Has many recent improvements, including Patent Simple Guard to Drum, Improved Cranks and Shakers, large riddling and screening surface, and great convenience and steadiness in work.



CHAMPION PLOUGHS,

(SINGLE, DOUBLE,
AND
THREE-FURROW),

For every Class of Work, every District, and every Country.

Made either with Handles, beam and frame of Solid Wrought Iron, or on the New Patent principle of Wood Handles and Combined Wood and Iron Beam.

HORNSBY'S Royal First Prize TURNIP CUTTERS, won the First Prizes of the R.A.S.E. at Bury and Oxford, being placed first in every Royal Trial during the past 10 years, have been entirely remodelled, so as to retain all their well-known excellences with the addition of most valuable improvements, including New Patent Knives, Wrought Iron Hoppers, &c., for securing the largest quantity and the best quality of work with the greatest ease and convenience in working. They are made for either Sheep, Calves, or Beast.

HORNSBY'S Royal First Prize ROOT PULPERS are also now made upon improved principles, securing the same important advantages, in addition to the well-known points of superiority, which gained them the Two First Prizes (for Hand and Power Pulpers) at the last two trials of R. A. S. E. in competition with all the leading makers.

HORNSBY'S New Royal First Prize CORN SCREENS obtained the Prize of £10, being the WHOLE AMOUNT OFFERED for Corn Screens at the Bury Trials of the Royal Agricultural Society of England, against Boby's, Nalder's, and Colman's principles.

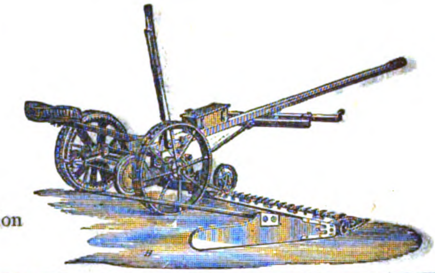
HORNSBY'S First Prize WINNOWERS have won Nine First Prizes of the Royal Agricultural Society of England.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

R. HORNSBY & SONS.

THE
HIGHEST
HONOURS IN
THE
WORLD

Gained in open Competition
at the last Trials of



THE
ROYAL
AGRICULTURAL
SOCIETY
OF
ENGLAND.

REAPERS

AT BIRMINGHAM TRIALS, 1876.

FIRST
SECOND
THIRD
Prizes for SELF-RAKERS; also Two High Commendations.

FIRST
SECOND
THIRD
Prizes for Paragon Combined MOWERS AND REAPERS, and High Commendation to Manchester Combined Machine.

FIRST
SECOND
THIRD
Prizes for ONE-HORSE REAPERS, including both Self-Delivery and Manual Delivery.

MOWERS

AT TAUNTON TRIALS, 1875.

FIRST
SECOND
THIRD
Prizes for PARAGON MOWERS, being the same Machines which, when fitted with Reaping parts, gained the

FIRST
SECOND
THIRD
Prizes as COMBINED MACHINES At Birmingham Trials.

FIRST AND ONLY
Prize for Paragon ONE-HORSE MOWER.

The results of the Royal Trials during the past 13 years may be summed up as follows:—

	1st Prizes.	2nd Prizes	3rd Prizes.	Sole Prizes.	Total.	Amounts.
R. HORNSBY & SONS	11	8	6	1	26	£373 0 0
SAMUELSON	0	2	2	1	5	65 0 0
BAMLETT	2	1	1	0	4	47 0 0
WALTER A. WOOD	2	2	0	0	4	42 0 0
BURGESS & KEY	0	1	1	0	2	33 0 0
CUTHBERT	0	0	1	0	1	8 0 0
PICKSLEY, SIMS, & CO.	0	1	0	0	1	5 0 0
KEARSLEY	0	0	1	0	1	7 0 0
BEVERLEY WAGON CO.	0	1	0	0	1	10 0 0

And Harrison & McGregor, W. Anson Wood, J. & F. Howard, Osborn & Co., John Williams, Vipan & Headley, Haughton & Thompson, W. A. Fell, Brigham & Co., Brenton, Lewis, & Lowcock, Mattinson, and Wray, who have obtained NO PRIZES.

IN ADDITION TO THE CONCLUSIVE ENGLISH TRIALS,

R. HORNSBY & SONS

Have attended the most important Mower and Reaper Trials on the Continent, gaining a large number of Prizes.

Every FIRST PRIZE but one Awarded to ENGLISH REAPERS at the CONTINENTAL TRIALS attended in 1877, was awarded to R. HORNSBY & SONS' MACHINES.

Since the Taunton Royal Mower Trials, R. HORNSBY & SONS' "PARAGON MACHINES" have gained at Continental Trials

25 HIGHEST HONOURS.

Consisting of GOLD MEDALS, FIRST PRIZES and DIPLOMAS OF HONOUR, and SIX SILVER MEDALS.

Further important improvements have been made during the present harvest, and the Machines now being made for the next harvest will possess advantages never before offered.

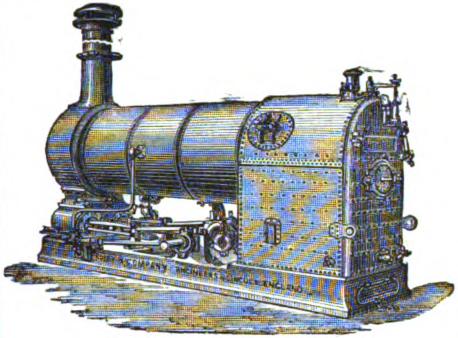
HORNSBYS' NEW PATENT HEDGE-CUTTING AND TRIMMING MACHINE

Gained the R.A.S.E. Special Silver Medal as a successful novelty, on its introduction at the Bristol Meeting, 1878, and has since gained many Silver Medals from different Agricultural Societies. It is a thoroughly practical and efficient Machine.

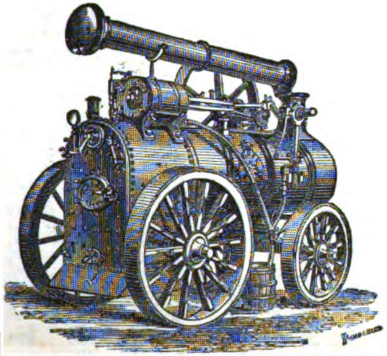
Catalogues Gratis and Post Free on application to

SPITTLEGATE IRON WORKS, GRANTHAM.

ROBEY & CO., ENGINEERS, LINCOLN.


ROBEY & COMPANY ENGINEERS LINCOLN ENGLAND

Patent Robey Fixed Engines.



Superior Portable Engine.

SOLE MANUFACTURERS OF THE
PATENT

"ROBEY" FIXED ENGINE,

Which saves all expensive foundations and high brick Chimney.

SUPERIOR PORTABLE ENGINES,

Most economical in consumption of fuel.

IMPROVED CORN-GRINDING MILLS!

And every description of Flour-Mill Machinery.

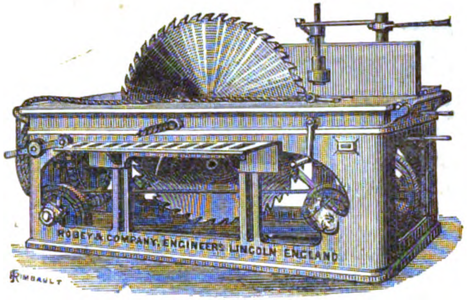
IMPROVED SELF-ACTING CIRCULAR SAW BENCHES,

And other Wood-working Machinery.

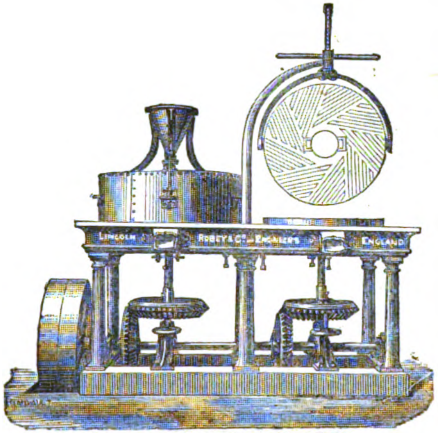
VERTICAL ENGINES,
HORIZONTAL FIXED ENGINES,
TRACTION ENGINES,
PATENT IRON FRAMED THRASHING MACHINES,

AND ALL KINDS OF MACHINERY FOR FARMERS, LANDOWNERS, &c., &c.

For full Particulars and Prices apply to


ROBEY & COMPANY, ENGINEERS LINCOLN ENGLAND
RIMBAULT

Self-acting Circular Saw Bench.



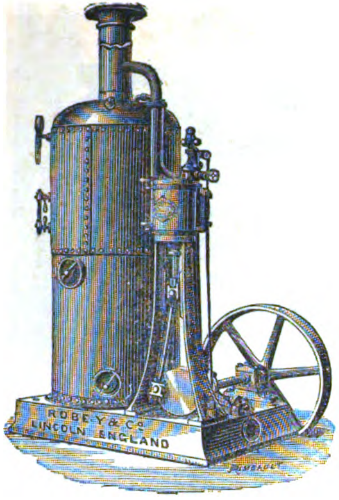
Improved Corn Grinding Mill.

ROBEY & CO., ENGINEERS, LINCOLN.

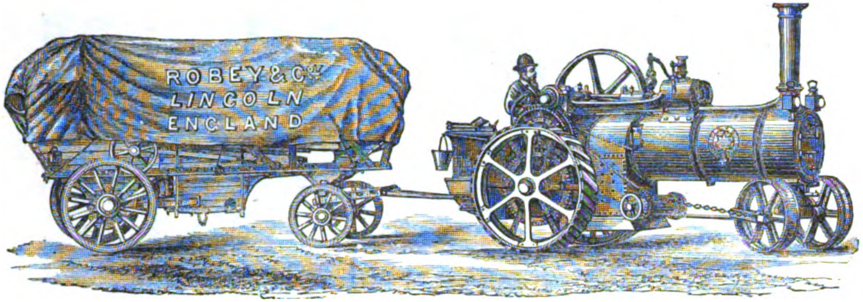
ROBEY & CO.,

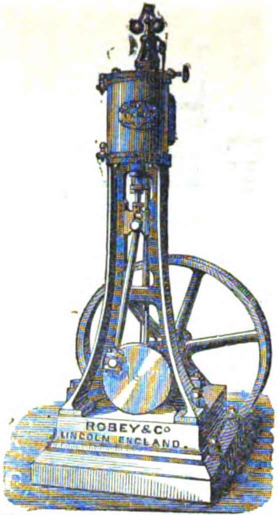
ENGINEERS,

LINCOLN,



VERTICAL ENGINES & BOILERS,
from 1½- to 12-horse power.





VERTICAL ENGINES,
from 1½- to 12-horse power.

SOLE MANUFACTURERS OF THE

PATENT "ROBEY" TRACTION ENGINE,

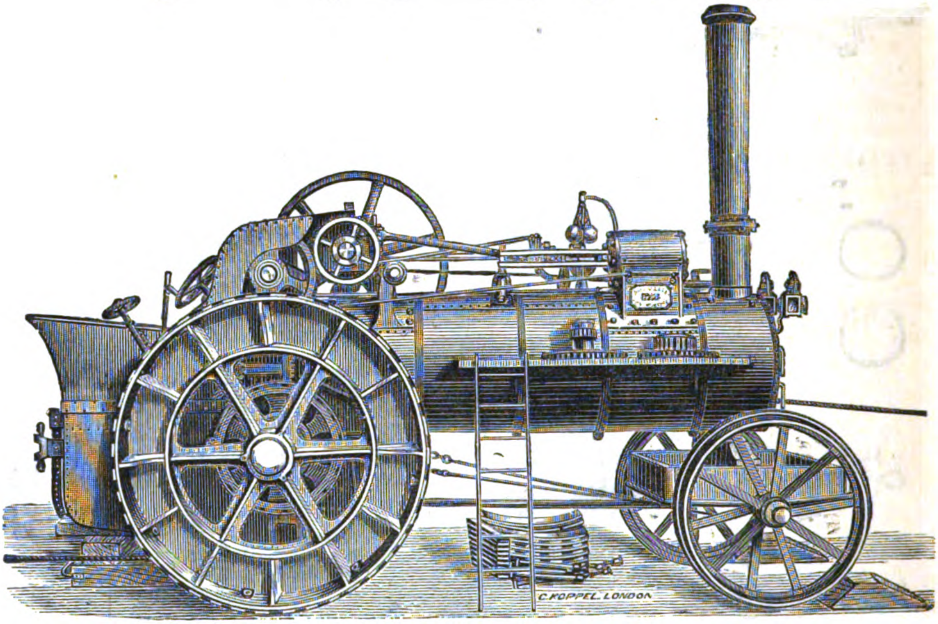
Which is not only self-propelling, moving itself and its accompanying machinery from place to place, but is also calculated to do all the work of a Farm, such as Ploughing, Thrashing, Sawing, &c., and when not employed at farm work, can be used for hauling heavy goods on common roads, for which work it will be found a very economical substitute for animal power.

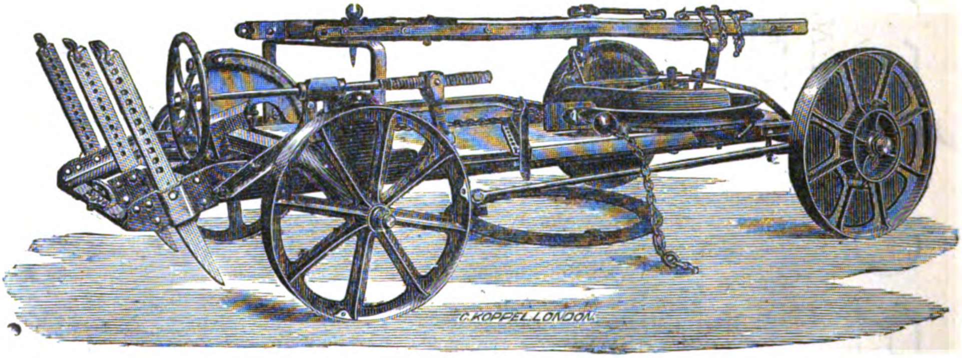
ROBEY & CO.'S THRASHING MACHINES with PATENT IRON FRAME are the STRONGEST, MOST DURABLE, and EFFICIENT YET PRODUCED, and require much less power to drive them than any other Thrashing Machines.

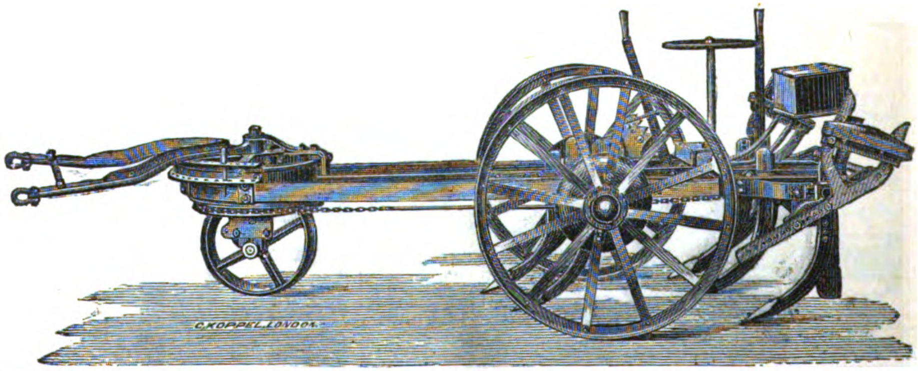
FOR FULL PARTICULARS AND PRICES APPLY TO THE SOLE MANUFACTURERS,

ROBEY & CO.,

FREDERICK SAVAGE'S
"AGRICULTURIST."







SAVAGE'S PATENT

PLOUGHING ENGINE.

In the impressions of my Engine on the preceding page, I intend to represent it with the wheels raised from the ground ready for ploughing, &c. To raise the hind wheels off the ground, the Engine is backed up the wedge-shaped pieces of wood shewn in the view on other side; when high enough the blocks of wood are put under the brackets fixed on each side of the fire-box, and then lower the Engine down the wedge-shaped pieces on to the blocks, and so keep the wheels from the ground, and enable them to be turned round without moving the Engine from where it is fixed on the blocks. The Engine is easily taken off the blocks by fixing one spud on each wheel, close to the ground, and run the Engine forward, when it is at once ready for travelling, or any other work for which Traction Engines are applied. By leading the ropes, as shewn in the view, one to the front and the other to the back, there is no necessity for double snatch blocks when steam cultivating; in consequence it requires less fixing. With my slow speed gear the Engine will get out of any hole or rut into which it may have sunk without other assistance. The Engine, by my arrangement of gearing, can be made to go from five yards a-minute to four miles an hour.

Awarded a GOLD MEDAL at the HIGHLAND AND AGRICULTURAL SOCIETY'S SHOW held at DUMFRIES, July 30 to August 1, 1878.

These Engines have been supplied to Farmers for Ploughing, Thrashing, Grinding, and Hauling Heavy Loads on common roads, drawing carts out of clay or marl pits, and are suitable for anything that is required on a Farm.

They have been sold to Contractors for making Docks, Sea Banks, &c., where hauling and hoisting are required.

PATENT

AUTOMATIC LEVER ANCHOR,

THE MOST EFFICIENT SELF-MOVING ANCHOR MADE FOR STEAM CULTIVATION.

It is really perfect, and made strong enough to resist the strain of any implement, and move on the headland with very little power from the Engine, and without any other assistance.

The retaining tines can be fixed so as it can be held in any kind of soil. The two fore wheels only require to be moved when setting to work.

PATENT

SELF-LIFTING AND TURNING

STEAM CULTIVATOR.

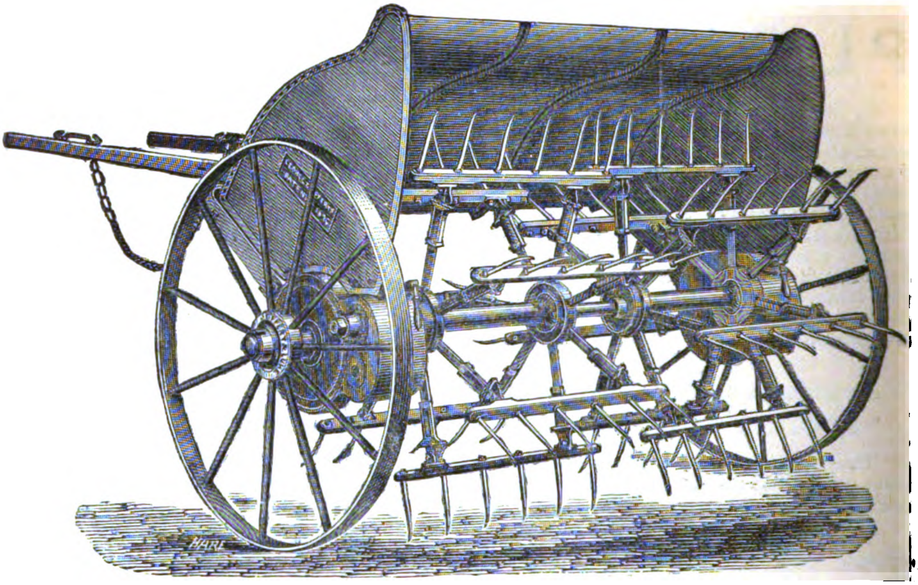
I employ means to lift the Cultivator by the forward rope before or at the headland, thus saving the extra strain upon the rope at the time of moving the Travelling Anchor, while by the same means the tines can be lifted out of the ground in any part of the field, so as to clear themselves when they get choked, without stopping the Engine.

Further Information will be most readily supplied on application to

FREDERICK SAVAGE,

ST NICHOLAS' IRONWORKS, KING'S LYNN.

JEFFERY & BLACKSTONE'S (late Ashby & Jeffery)



ROYAL SOCIETY OF ENGLAND

FIRST PRIZE HAYMAKERS,

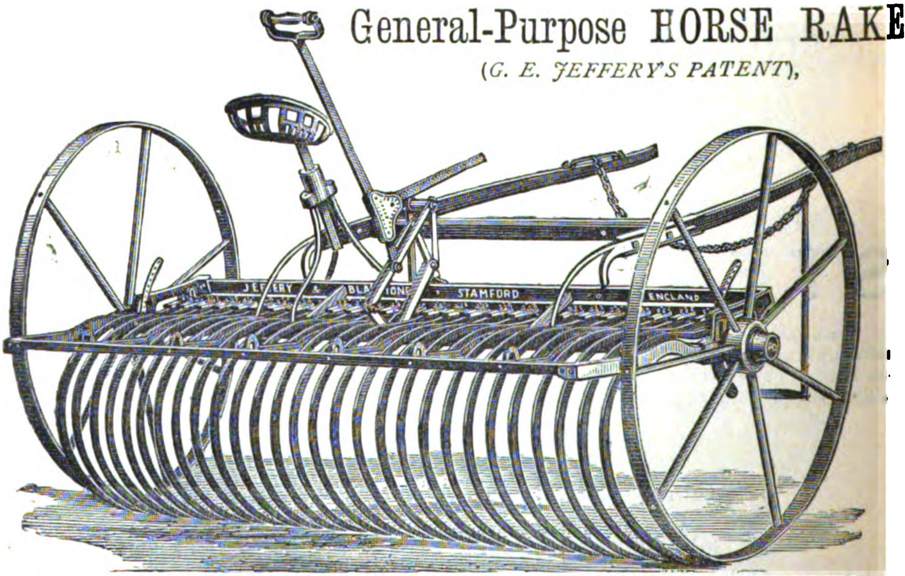
Which have been Awarded upwards of 125 PRIZES.

They are now acknowledged to be the Simplest, Strongest, Cheapest, and Most Durable Machines.

JEFFERY & BLACKSTONE'S New Patent

General-Purpose HORSE RAKES

(G. E. JEFFERY'S PATENT),



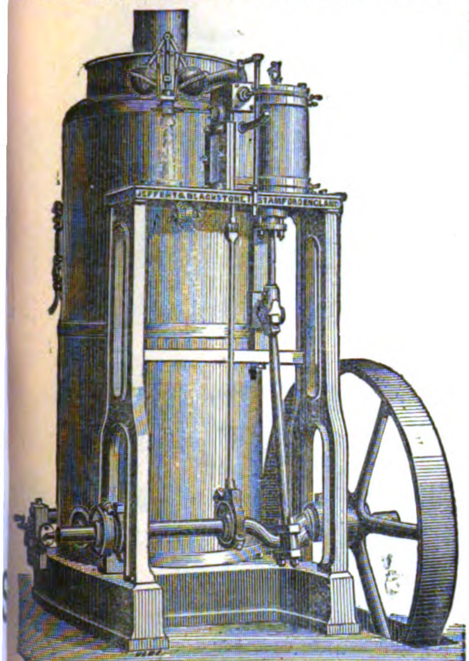
Both Manual and Self-Acting. They are more Simple, Efficient, and Durable, and better adapted for gathering Hay, Corn, or Stubble, than any other yet introduced.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

JEFFERY & BLACKSTONE'S

NEW PATTERN

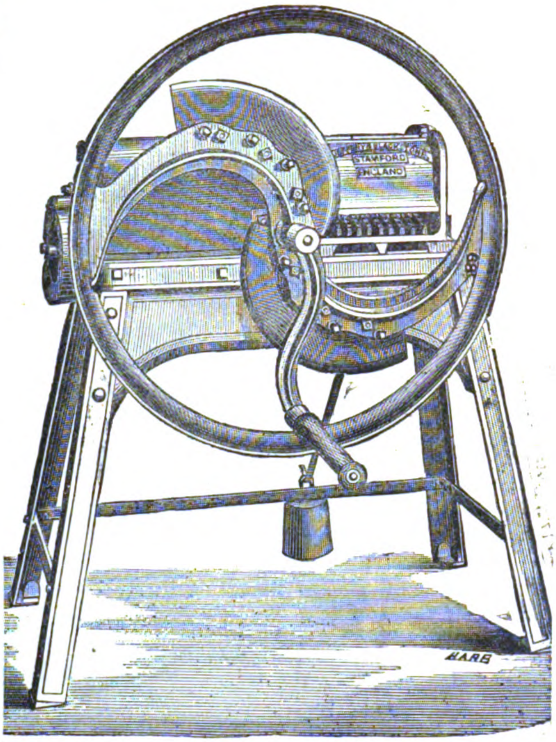
VERTICAL STEAM ENGINE



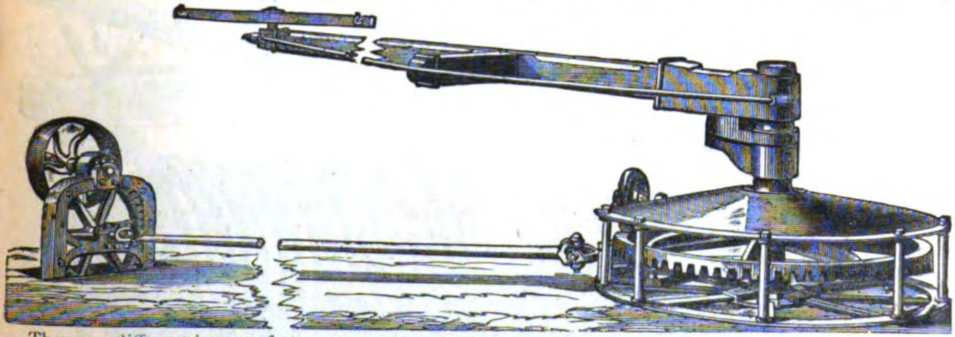
For Farmers, Merchants, and Contractors.
Made with Wrought Angle-Iron Frame and Legs.
See inside of ALMANACK *for Notice.*

NEW PATTERN

CHAFF-CUTTER.



NEW SAFETY HORSE GEAR.

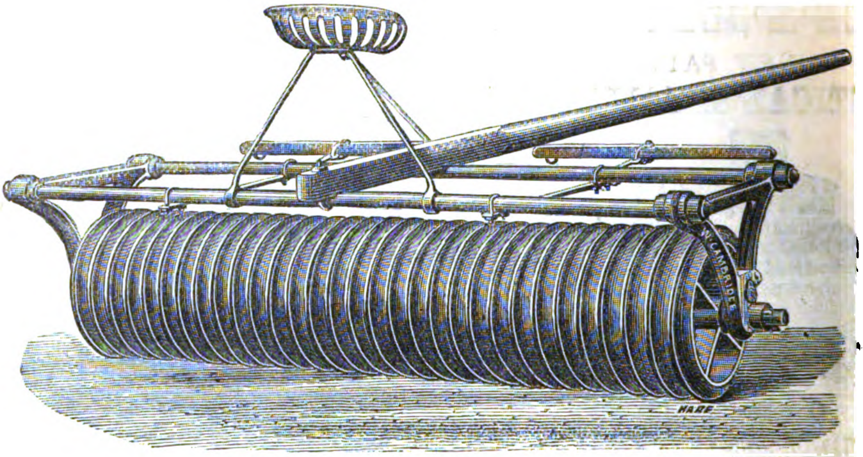


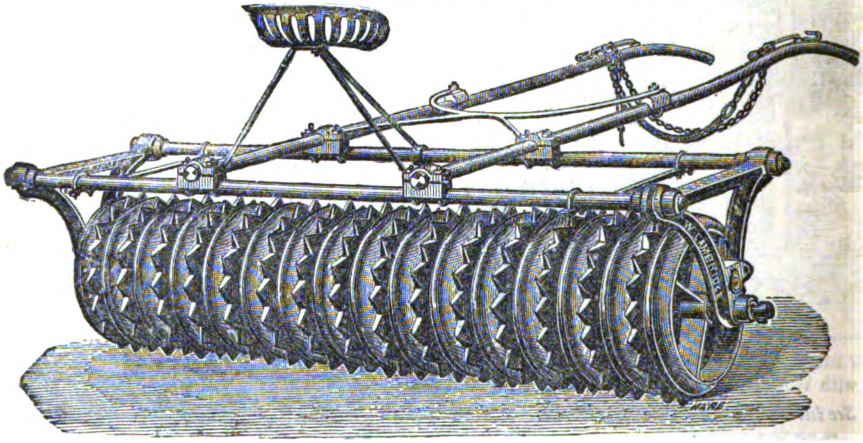
These are different in manufacture to those generally made. The Frames, Pillars, and Intermediate Head are constructed of wrought iron; the upright shaft and pole flange are connected by a self-acting clutch, by means of which the sudden strain on the machinery is prevented when starting it, and which disengages itself immediately the horse is stopped, thus preventing the pole striking his hocks. The pole is also stayed on an improved method, which effectually prevents all springing and consequent jar on the horse.

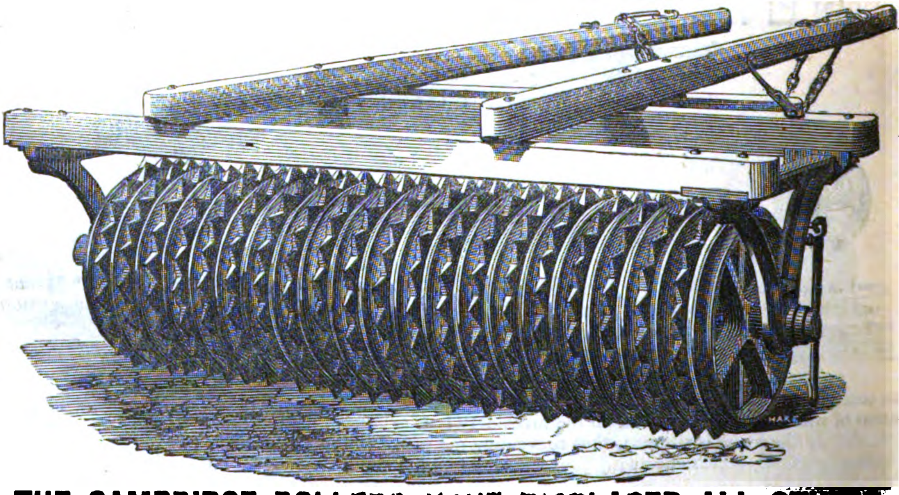
Catalogue, with Price Lists, free on application to

JEFFERY & BLACKSTONE,
RUTLAND IRONWORKS, STAMFORD.

For Classified List of Advertisers, see page 64 of Advertising Sheet.







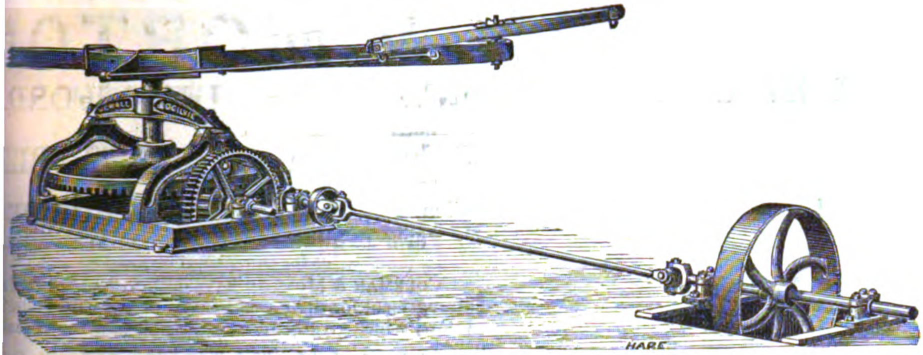
SMITHFIELD CLUB SHOW, STAND 220, GALLERY BAYS.

THE CAMBRIDGE ROLLERS HAVE DISPLACED ALL OTHERS.

APPLY FOR COMPLETE CATALOGUE TO THE MAKERS,

NEWALL & OGILVIE, late CAMBRIDGE & CO., St Philip's Ironworks, BRISTOL.

SMITHFIELD CLUB SHOW, STAND 220, GALLERY BAYS.

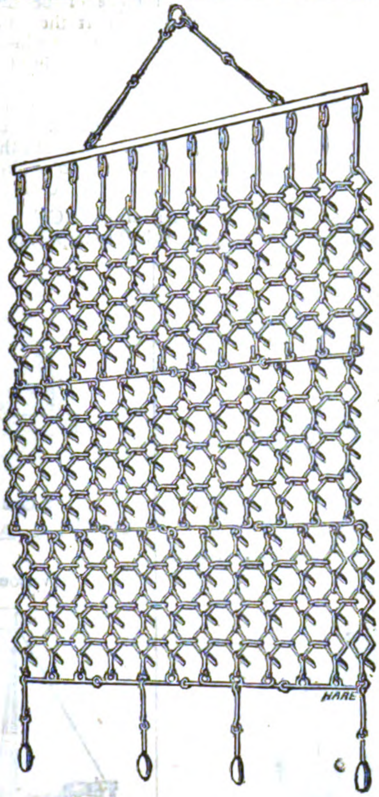


These **CHAIN HARROWS** ave never been beaten.

FIRST PRIZE
IN EVERY
COMPETITION.

Apply for Catalogue.

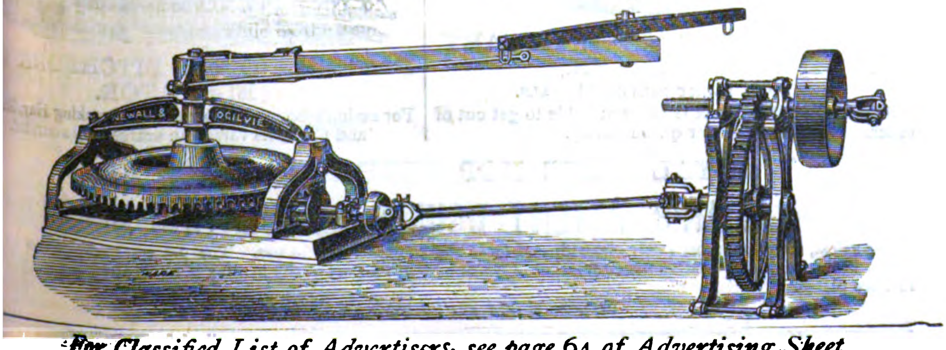
Newall & Ogilvie
St Philip's Ironworks,
BRISTOL.



The most Complete
Stock of
HORSE GEARS
for all Purposes—
from Pony Gear to the
heaviest powered Gear.

All of the most High-class
Design
and Workmanship.

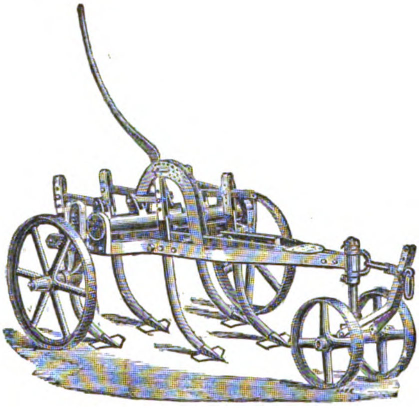
Newall & Ogilvie
late
CAMBRIDGE & Co.



COLEMAN & MORTO

LONDON ROAD IRONWORKS, CHELMSFORD

COLEMAN'S CULTIVATOR has Won 150 FIRST PR

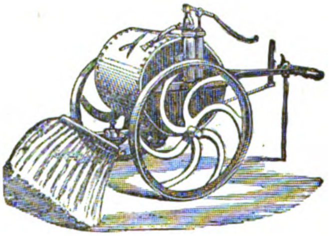


Vienna Exhibition, 1873—"Grand Medal fo
Paris Exhibition, 1878—TWO Prize

COLEMAN & MORTON have designed and pat arrangement for the Front Wheels of their Celeb vators, which greatly adds to their steadiness and d

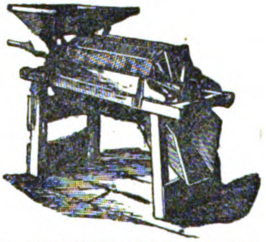
In place of the single wheel and span iron, which support the fore part of the implement, adopted a *pair* of wheels, one of which is pinned axle, the other being loose. The axle is thus volve in a suitable bearing of considerable le preventing any wear in the bosses of the wheels great steadiness to the implement. This arr considerably lightens the draught, which, in any fair test has been applied, has proved lighter th vator capable of doing the same work.

All sizes of Coleman's Cultivators can be this valuable improvement.



HAND WATER-CART AND GARDEN ENGINE,

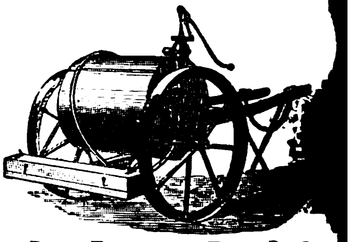
For use in Gentlemen's Gardens and Grounds. Holds 35 gallons.



PATENT ADJUSTABLE ROTARY CORN SCREEN.

AWARDED EIGHT SILVER MEDALS.

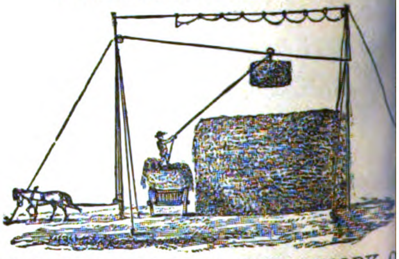
Suitable for all kinds of Grain, not liable to get out of order. Saves clear 2s. per qr. on Barley.



PARIS EXHIBITION FIRST PRIZE.

WATER AND LIQUID MAN CARTS,

In various sizes and for all requirements.



PATENT HORSE PITCH ELEVATOR.

For saving labour in unloading and stacking and Corn, its value can scarcely be overr

ROYAL PRIZE HOP SYRINGING MACHINE.

COLEMAN'S PATENT DOUBLE CIRCULATING BOILER

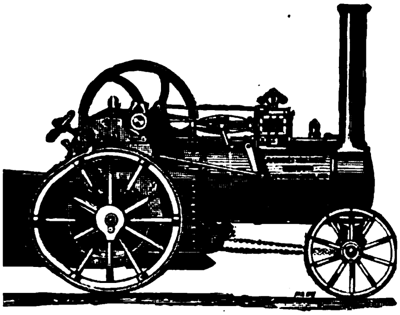
Is the safest, simplest, most easily cleaned, and most economical Boiler in use. The patented arrangement a powerful, rapid, and continuous circulation of water over every part of the heating surface, and especially over furnace plates.

Catalogues and Testimonials on Application.

NSOMES, SIMS, & HEAD,

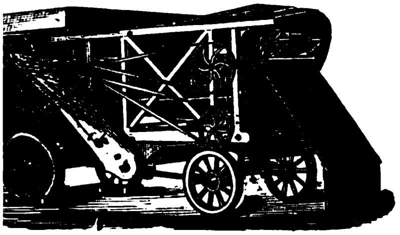
MANUFACTURERS OF

AGRICULTURAL LOCOMOTIVES
AND
PORTABLE STEAM ENGINES.



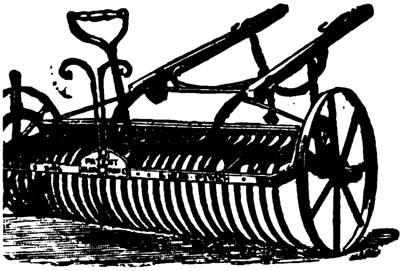
RANSOMES, SIMS, & HEAD were the earliest makers of Portable Steam Engines. They are strong and simple in design, and economical in the consumption of fuel. From 4-horse power to 20-horse power. R., S., & H. have brought out a new Traction Engine, as shewn in the drawing, which embodies many improvements. It is made in two sizes—6-horse power and 8-horse power—furnished with patent winding drum, and other appliances.

STEAM THRASHING MACHINES,



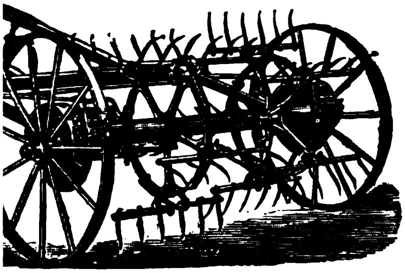
Made in different sizes, both Single and Double Blast, with Reciprocating Shakers, Patent Twisted Reversible Beaters and Adjustable Screen. Arranged either as Portable or Fixture Machines. Winners of two Prizes of £20 at the last trials of the R.A.S.E. at Cardiff, 1872. They will thrash and dress all kinds of grain in the most perfect manner.

PATENT "STAR" HORSE RAKES.



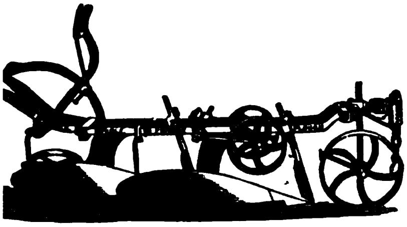
More than 25,000 of these Rakes have been sold since they won the First Prize of the R.A.S.E. at Manchester, 1869, against all the leading makers. Fitted with steel teeth, high wrought wheels, side levers, and seat for driver, when required. Made in seven sizes. Everywhere acknowledged to be "The Standard Implement."

PATENT HAYMAKERS,



With forward and backward action, and adjustable Tines to suit any crop. Very simple and light in work. Made in two sizes, and also as single-action machines.

HORSE PLOUGHS
(ALL KINDS).



R., S., & H. have long been known for the manufacture of Ploughs, being the earliest Patentees in the Kingdom. They have won more prizes for Ploughs from the R. A. S. E., and won more All-England prizes at Ploughing Matches, than any other firm. They make Single Swing, and Wheel Ploughs; Double, Three Furrow, and Multiple Ploughs; Ridging, Turnwrest, and Subsoil Ploughs; and many other varieties in wood and iron, fitted with "the best shares and wearing parts."

Full Particulars and Prices on application to

RWELL WORKS, IPSWICH.

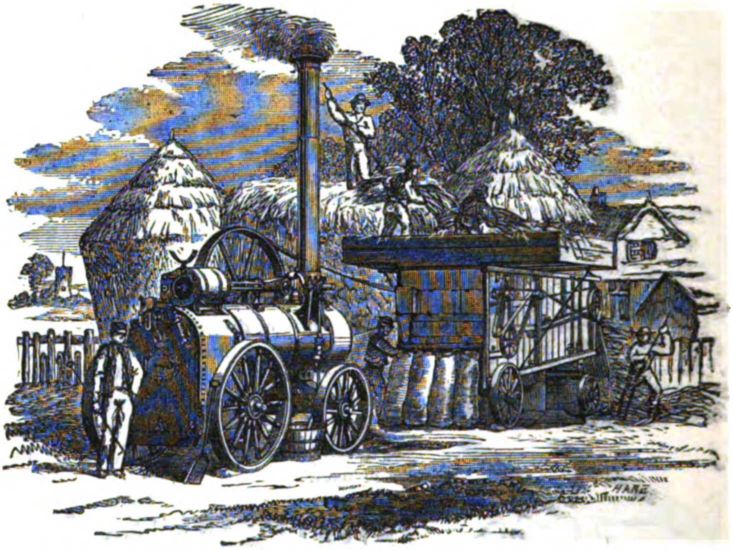
For Classified List of Advertisers, see page 64 of Advertising Sheet.

MARSHALL, SONS, & CO., Limited;

BRITANNIA IRON WORKS, GAINSBOROUGH;

AND

3 KING STREET, CHEAPSIDE, LONDON, E.C.



GENERAL ENGINEERS, AND MANUFACTURERS OF

IMPROVED PORTABLE STEAM ENGINES,

Traction Engines of new design,

VERTICAL AND HORIZONTAL STATIONARY ENGINES,

THRASHING MACHINES,

STRAW ELEVATORS, CORN GRINDING MILLS, AND CIRCULAR SAW BENCHES.

M., S., & Co. have received the following important Awards at the Great International Exhibitions:—

PARIS, 1878.

GOLD MEDAL—For Portable, Vertical, and Horizontal Engines.

GOLD MEDAL—For Thrashing Machines with Patent Safety Self-Feeder and Combined Drum Protector.

SILVER MEDAL—For Patent Tea Rolling Machinery.

HONOURABLE MENTION—For Traction Engines.

VIENNA, 1873.

MEDAL for PROGRESS and MEDAL for MERIT—For Portable Engines, Thrashing Machines, and Grinding Mills.

PARIS, 1867.

GOLD MEDAL—For Portable Engines and Thrashing Machines.

In addition to over **150 Gold and Silver Medals** from the ROYAL AGRICULTURAL SOCIETY of ENGLAND and other leading Agricultural Societies in this country and abroad.

Illustrated Catalogues Free on Application.

E. S. HINDLEY, BOURTON, DORSET.

SMALL STEAM ENGINES,

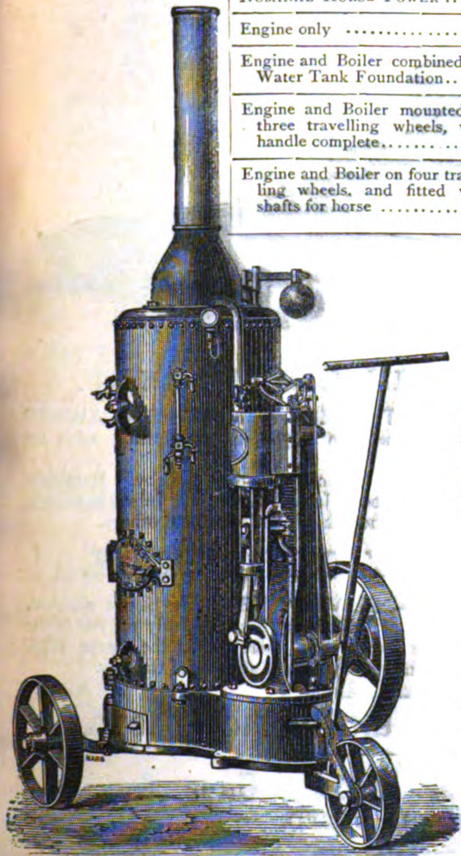
STATIONARY OR ON WHEELS.

HONOURABLE MENTION, PARIS EXHIBITION, 1878.

Prize Medals awarded in 1877 at Ayr, Derby, and Burton-on-Trent; also 1878 at Carlisle and Leek.

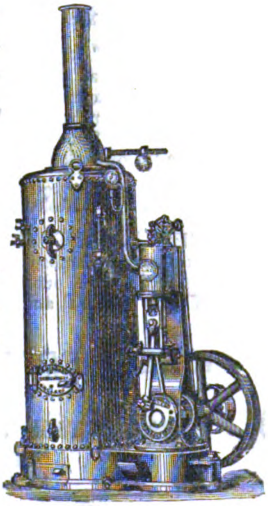
These Engines are recommended as being strongly made, very compact, easily managed, and in every way well adapted to do the work of the farm, such as CHAFF-CUTTING, PULPING, GRINDING, CRUSHING, driving small THRASHING MACHINES, ELEVATORS, CIRCULAR SAWS, &c., &c. ☞ They are far more economical in work than Horse Power, and cheaper in first cost; a 2-Horse Power Engine and Boiler costing no more than one good Horse.

NOMINAL HORSE POWER	1	1½	2	3	4	5	6	8	10
Engine only	£15	£18	£21	£28	£35	£45	£52	£60	£70
Engine and Boiler combined, on Water Tank Foundation	39	47	55	70	88	100	115	135	157
Engine and Boiler mounted on three travelling wheels, with handle complete	41	49	57	75	95	110	125	145	167
Engine and Boiler on four travelling wheels, and fitted with shafts for horse	42	50	59	79	97	112	128	150	172



Prices include free delivery by rail, and a man's time and expenses sent to put an Engine to work.

Estimates given for any Machinery in connexion with these Engines.

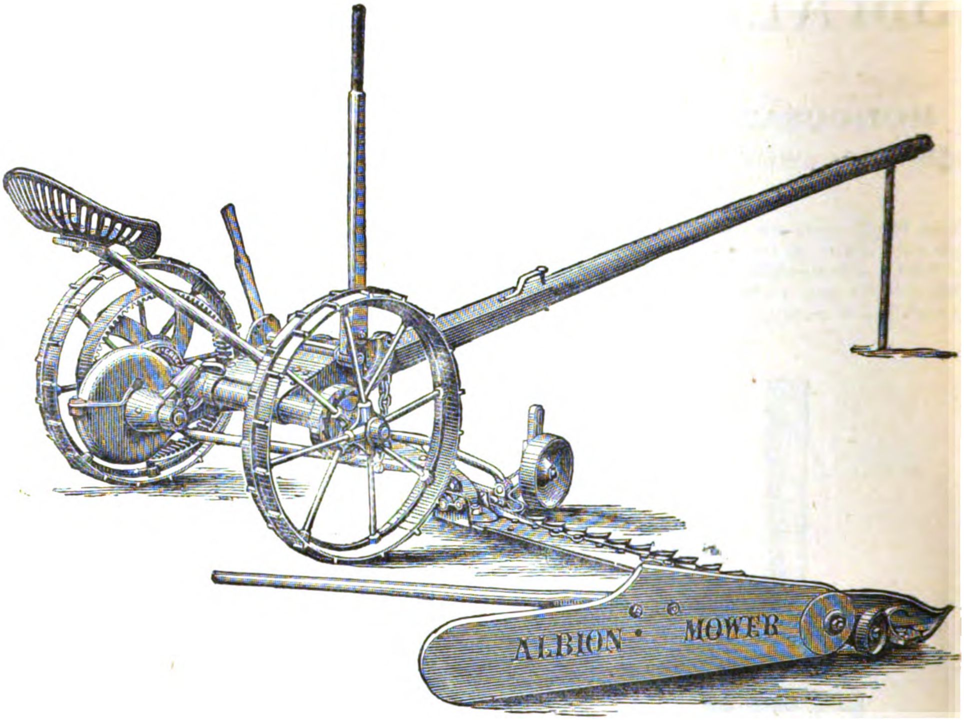


ILLUSTRATED CATALOGUES AND NUMEROUS TESTIMONIALS ON APPLICATION.

E. S. HINDLEY, BOURTON, DORSET.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

HARRISON, M'GREGOR, & CO.'S
"ALBION" MOWERS AND REAPERS



ARE THE BEST MACHINES IN THE MARKET.

The **"ALBION" MOWER** carried off **FOURTEEN FIRST PRIZES**, or the **HIGHEST AWARD** on every occasion, at the **PRINCIPAL FIELD TRIALS** held in 1878, in competition with the following makers' Machines:—

Hornsby's, Samuelson's, Walter A. Wood's, Howard's, the "Buckeye," the "Kirby," Bamlett's, Kearsley's, Picksley, Sims & Co.'s, Burgess & Key's, W. Anson Wood's, Jack & Sons', the Johnstone Co.'s, the "Sprague," Lowcock & Barr's, Handyside & Co.'s, Powell Brothers & Whittaker's, and others.

THE FIRST PRIZE AT EVERY COMPETITION.

The **NEW PATENT IMPROVED "ALBION" SELF-DELIVERY REAPER** is the simplest, handiest, strongest, and most durable Machine before the public. Its efficiency has been fully proved in the public trial fields, where, out of Four Competitions in which the Reaper took part during the season 1878, it gained **TWO FIRST** and **TWO OTHER PRIZES**, against the leading Machines of the day.

PRIZE MEDAL AT THE PARIS EXHIBITION, 1878.

101 First Prizes, Gold and Silver Medals, Cups, &c., &c.,

SINCE 1873 AGAINST ALL THE WORLD.

Catalogues and all Particulars will be furnished Free.

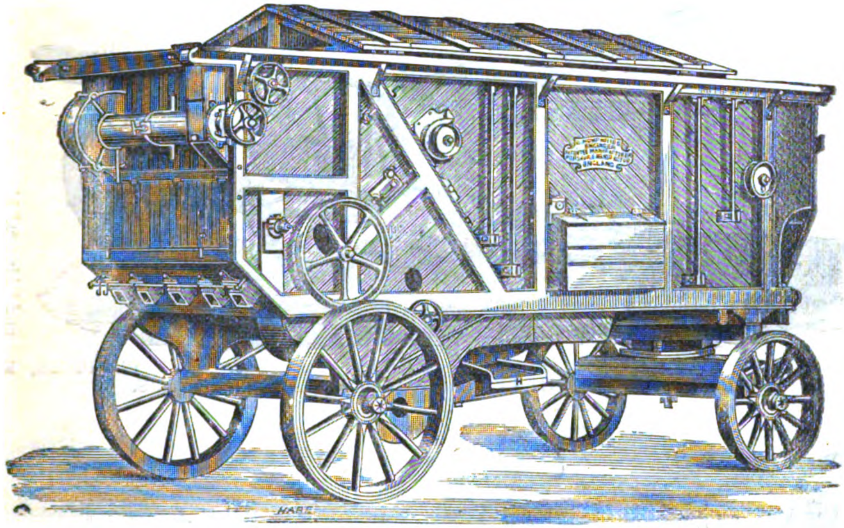
MANUFACTORY:

ALBION IRONWORKS, LEIGH, LANCASHIRE.

For Classified List of Advertisers, see page 64 *of Advertising Sheet.*

EDWARD HUMPHRIES,

ENGINEER, PERSHORE,



MANUFACTURER OF

ALL-ENGLAND PRIZE THRASHING MACHINES,

PORTABLE AND FIXED, HORIZONTAL AND VERTICAL STEAM ENGINES.

Awarded SILVER and BRONZE MEDALS at the PARIS EXHIBITION, 1878.

Also LONDON, VIENNA, AND ROYAL AGRICULTURAL SOCIETY.

SPECIALITIES.

STRAW, HAY, AND CORN ELEVATORS.

CORN-GRINDING MILLS.

CLOVER SHELLERS.

CIDER-MAKING MACHINERY.

CHAFF-CUTTERS.

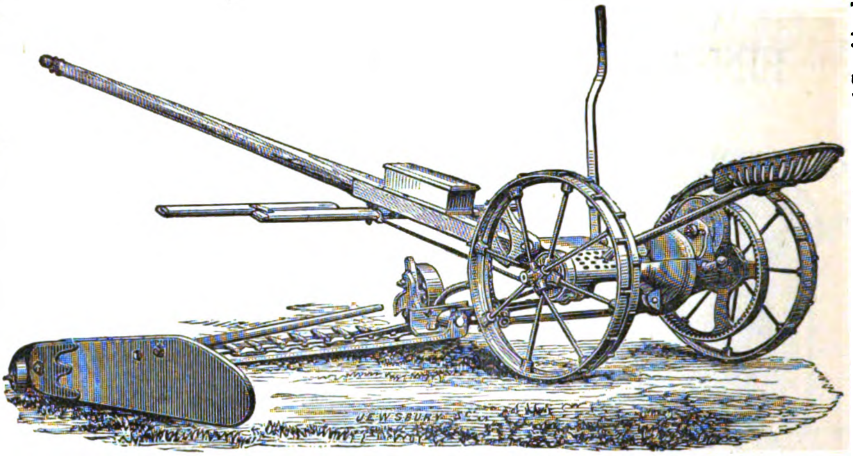
SAW BENCHES, &c.

For Classified List of Advertisers, see page 64 *of Advertising Sheet.*

PICKSLEY, SIMS, & CO. (Limited).

GOLD MEDAL, PARIS EXHIBITION, 1878.

Manufacturers of every description of Agricultural Implements and Machines, including the FIRST PRIZE PATENT "BALANCE STANDARD," "NOVELTY,"



and "MODEL" Mowers and Reapers, and Combined Mowers and Reapers. FIRST PRIZE Horse Rakes, American Horse Rakes, and Hay Collectors.

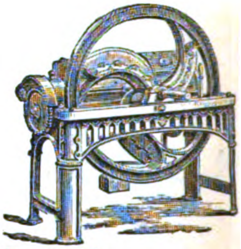
GOLD MEDAL, PARIS EXHIBITION, 1878.

ROYAL EXHIBITION AND FIRST PRIZE PATENT CHAFF CUTTERS, ROOT PULPERS, ROOT SLICERS, DOUBLE AND TREBLE ACTION TURNIP CUTTERS.

FIRST PRIZE

OAT, BEAN, INDIAN CORN, GRIST, AND GENERAL

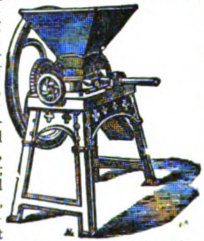
GRINDING AND BRUISING MILLS.



FIRST PRIZE OIL-CAKE MILLS. FIRST PRIZE HORSE GEARS.

FIRST PRIZE ZIG-ZAG, CHAIN, AND DRAG HARROWS, LAND ROLLERS,

CLOD CRUSHERS, LAWN MOWERS, GARDEN ROLLERS, &c., &c., &c.



P., S., & Co., LIMITED, have gained with their Agricultural Machines over 616 FIRST PRIZES, GOLD AND SILVER MEDALS, &c., in the principal Trials and Exhibitions held in the United Kingdom and abroad. During 1878 the following important Prizes:—July, 1878, Diploma of Honour—for Steam Power Chaff Cutter, at Svendborg, Sweden; First Prize—for Horse Gear, at Jonkoping, Sweden; Special Medal—for Chaff Cutter, at Jonkoping, Sweden; Special Medal—for Oil Cake Mill, at Jonkoping, Sweden; Special Medal—for T.x. Turnip Cutter, at Jonkoping, Sweden. At the Dutch National Agricultural Society's Trials, held at Delft, Holland, September 17th, 1878:—First Prize—for Horse Power Chaff Cutter; First Prize—for Hand Power Chaff Cutter; First Prize—for Root Pulper, ; First Prize—for Grist Mill, for Power; Second Prize—for Oat and Bean Mill, for Hand Power, in addition to the numerous First Prizes gained by their various Agricultural Implements and Machines at the Agricultural Trials and Exhibitions held in the United Kingdom. P., S., & Co., Limited, have obtained a world-wide celebrity for the general excellence of their Agricultural Implements and Machines, and can confidently recommend them as being the most *Simple*, *Efficient*, *Strong*, and *Durable* of any Implements and Machines in the Market.

Full Particulars, and Prices of all their Manufactures, supplied free on application to

PICKSLEY, SIMS, & CO. (Limited),

Works—BEDFORD FOUNDRY, LEIGH, LANCASHIRE.

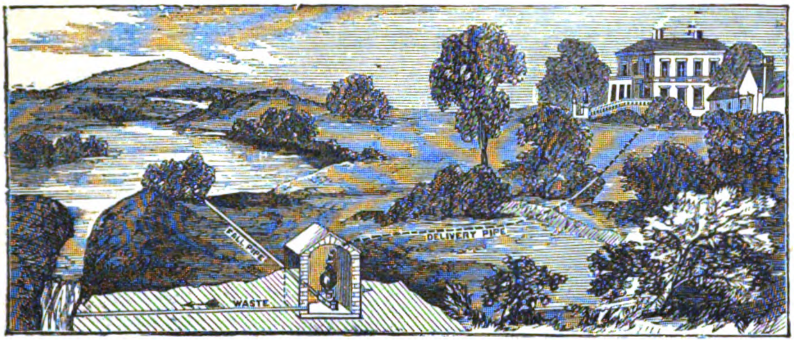
S. OWENS & CO.,

HYDRAULIC AND GENERAL ENGINEERS,

WHITEFRIARS IRONWORKS, Whitefriars St., Fleet St.,

LONDON.

Agent in Scotland—W. HUME, 195 Buchanan Street, Glasgow.



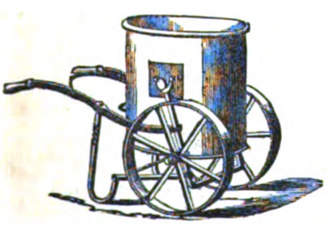
THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful self-acting apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

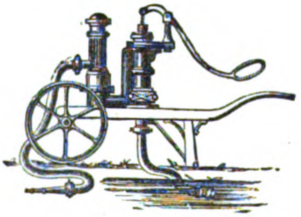
Overshot, Breast, or Undershot Water-Wheels, Turbines, and Pumps,

For Raising Water to Mansions or for Driving Thrashing, Sawing or other Farm Machinery.

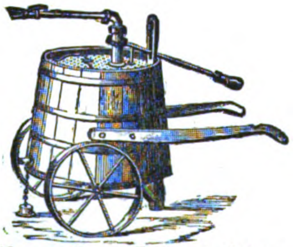
The above illustration shews an Overshot Water-Wheel working a set of Treble-barrel Pumps, for the supply of a Mansion, Farm, &c., where a large quantity of water is required.



No. 49A.—Galvanized Swing Water Carriers for Garden Use.



No. 46A.—Double-action Force Pump on Barrow, for Watering Gardens and Distributing Liquid Manure.



No. 49.—Garden Engines in Oak or Galvanized Iron Tubs.

S. OWEN & CO. manufacture and erect every description of Hydraulic and General Engineers' work for Mansions, Farms, &c., comprising Pumps for Deep and Shallow Wells, Warming Apparatus, Baths, Drying Closets, Gas Works, Apparatus for Liquid Manure Distribution, Hydrants, Hose, Pipes, &c., &c. Particulars taken in any part of the country. Plans and Estimates Furnished.

Illustrated Catalogues can be had on Application.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

GOLD MEDAL

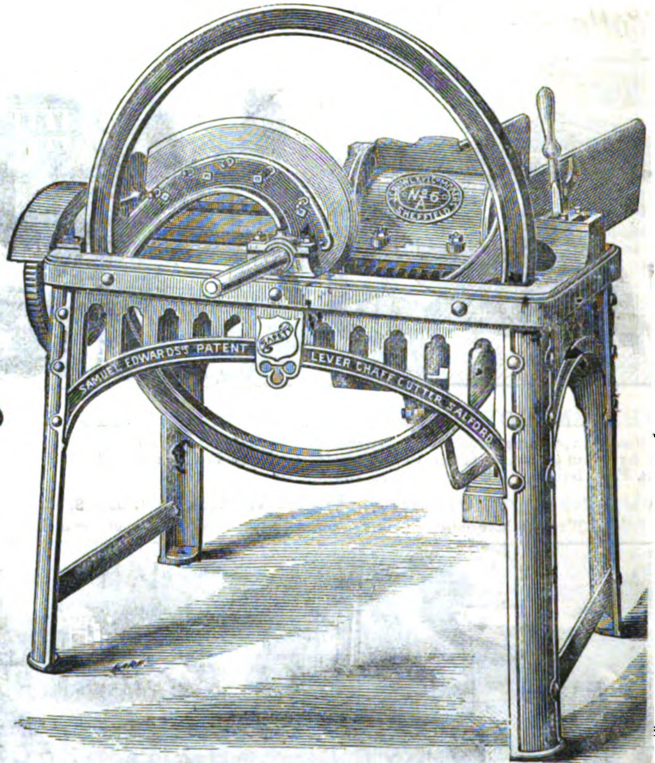
AWARDED AT THE

UNIVERSAL EXHIBITION, PARIS, 1878,

IN COMPETITION WITH ALL THE WORLD.

SAFETY LEVER CHAFF CUTTERS

(S. EDWARDS' PATENT.)



THE ONLY CHAFF CUTTERS WHICH CAN BE **STOPPED,** THE **FEED REVERSED,** AND THE **LENGTH OF CUT CHANGED** BY MEANS OF **ONE LEVER.**

THE "INVINCIBLE" LAWN MOWER

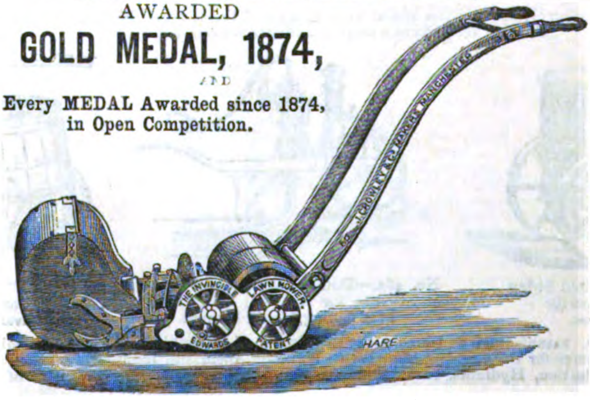
(SAMUEL EDWARDS' PATENT),

AWARDED

GOLD MEDAL, 1874,

AND

Every MEDAL Awarded since 1874, in Open Competition.



TESTIMONIAL.

Out of numbers we have received.)

From CHAS. ABBOT PETERS, Esq., Claremont, Henleaze Park, Westbury-upon-Trym, near Bristol, June 13, 1877.

"The large Lawn Mower you supplied me with some time ago is the best Lawn Mowing Machine I ever had, far better than any English and American ones I formerly used."

LAWN MOWER CONTEST.

The most crucial trial of Lawn Mowers ever known in this country was at the National Lawn Mower Contest in Birmingham, July 8, 1874, when the Premier Gold Medal was awarded to Samuel Edwards' "Invincible." The result proves conclusively that it is, without exception, the best Lawn Mower made.

Every Machine guaranteed.
Larger sizes in hand.

Prices and Illustrated Catalogues post free on application.

Sole Makers—JOHN CROWLEY & CO., SHEFFIELD.

HYDES & WIGFULL, Limited,

STANLEY STREET, SHEFFIELD,

MANUFACTURERS OF

PATENT WROUGHT-IRON CONTINUOUS FENCING.

PATENT "LOCK-BAR" WROUGHT-IRON HURDLES.

WROUGHT-IRON TREE GUARDS of every style.

Wrought-Iron Field, Park, and Entrance Gates.

A STRONG FIELD GATE FOR ONE GUINEA.

WROUGHT-IRON SHEEP FENCES from 1s. 6d. per yard.

GALVANIZED SHEEP AND GAME NETTING.

HYDES & WIGFULL, Limited,

STANLEY STREET, SHEFFIELD,

UNDERTAKE EVERY DESCRIPTION OF

ESTATE WORK, and supply and erect every Class of

AGRICULTURAL AND HYDRAULIC MACHINERY.

ILLUSTRATED CATALOGUES POST FREE.

SPECIAL ESTIMATES ON APPLICATION.

HYDES & WIGFULL, Limited, will gladly wait upon and advise Gentlemen on all subjects suggested by this Advertisement.

SHEFFIELD.

BAYLISS, JONES, AND BAYLISS,

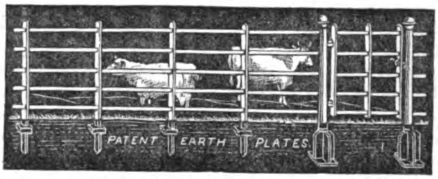
PATENTEES AND MANUFACTURERS OF SOLID AND TUBULAR BAR

FENCING, HURDLES, TREE GUARDS, &c., &c.

Tree Guard.

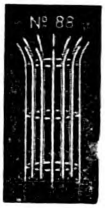
Price from 12s. each, Delivered.

Patent Continuous Bar Fencing, with Patent Earth Plates.



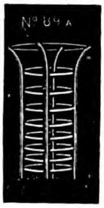
Price from 2s. 1d. per yard, delivered at most Railway Stations.

Tree Guard.



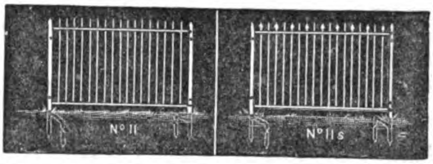
Price 17s. 6d. each, D livered

Tree Guard.



Price from 18s. each, Delivered.

Unclimbable Vertical Bar Hurdles.



No. 11.—4 ft. high, 5s. 11d. per yard, } Delivered at most
No. 11s. 4 ,, 6s. 7½d. ,, } Stations.

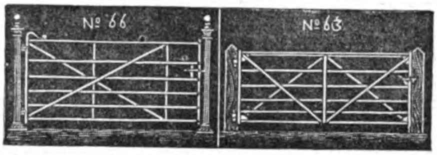
Tree Guard.

Price from 14s. each.

Garden Rollers.

20 in. diam. Price £3, 16s.

Wrought Iron Field and Entrance Gates.



No. 66. Gate and Pillars, £2, 16s.—No. 63. Gate only £1, 3s.

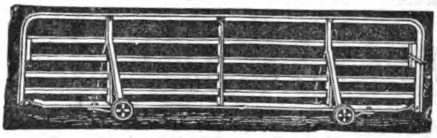
Garden Seats.

6 feet long. Price £1, 5s.

Jet Varnish.

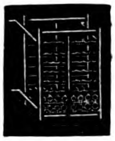
BEST PREPARED JET VARNISH
PRICE IS 6s PER GALLON CARRIAGE PAID

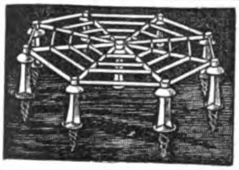
Sheep Folding Hurdle.—No. 87c.



For Price see Catalogue.

Wine Bins.





Patent Wrought Iron Vermin-Proof Rick Stands, on Cast Iron Pillars, with Screw Bases.

Require no foundation, cannot be turned over with the wind.

Complete Catalogue, containing 270 *Illustrations, free on application.*

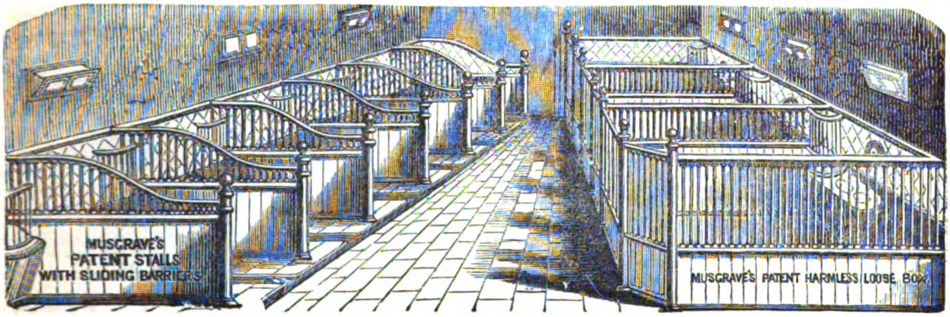
Manufactory—VICTORIA WORKS, WOLVERHAMPTON.

LONDON OFFICES—3 CROOKED LANE, KING WILLIAM STREET, E.C.

For Classified List of Advertisers, see page 64 *of Advertising Sheet.*

IRONFOUNDERS TO H.R.H. THE PRINCE OF WALES.

Prize Medals—London, 1862; Paris, 1867; Brussels, 1876; Paris, 1878. Silver Medals of Royal Agricultura Society—Leeds, 1861, and Bury St Edmunds, 1867; also numerous Medals from minor Societies.

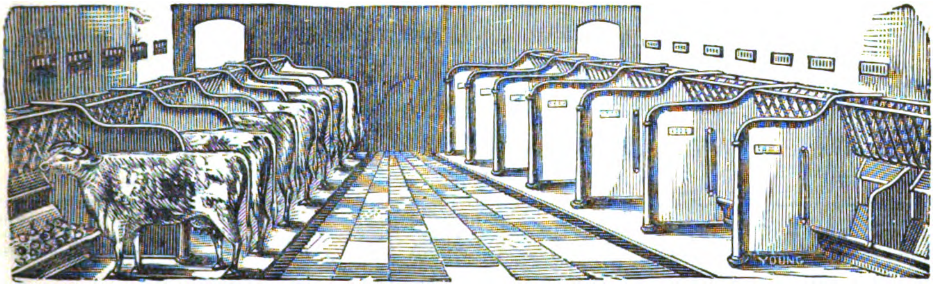

MUSGRAVE'S PATENT STALLS WITH SLIDING BARRIERS
MUSGRAVE'S PATENT HARMLESS LOOSE BOX

MUSGRAVE'S PATENT STABLE FITTINGS

Have taken First Prizes at all Exhibitions and Agricultural Shows at which they have been exhibited, for their Superior Quality and Valuable Improvements.

Suitable Designs have been specially prepared to meet the requirements of Farm and Draught Horses.

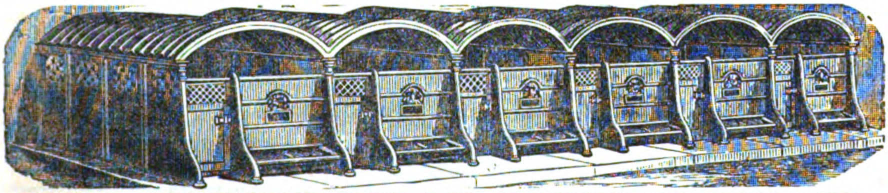
SAFETY FROM THE SPREAD OF RINDERPEST AND OTHER EPIDEMICS.



MUSGRAVE'S PATENT IRON COW-STALLS AND FRESH AIR-INLETS,

AS USED IN THE GOVERNMENT MODEL FARMS,

Are perfect in their arrangements for Feeding and Ventilation; every part being of iron, they are indestructible, inexpensive, very compact, cleanly, and healthful to the animal. Should sickness occur, if the ironwork be painted and the walls washed with lime, they can neither harbour nor communicate contagion.



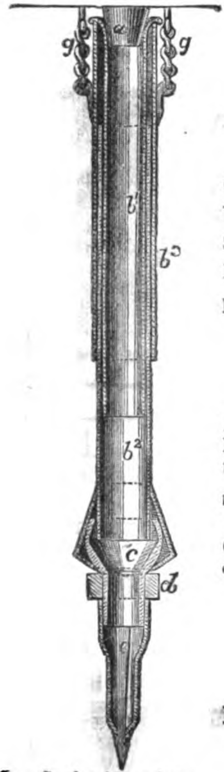
MUSGRAVE'S PATENT IRON DOG KENNELS AND PIGGERIES.

Priced Engravings of the above, and of MUSGRAVE'S PATENT SLOW COMBUSTION STOVES, *will be sent Free on application to*

MUSGRAVE & COMPANY (Limited),

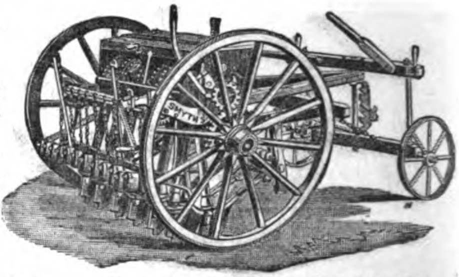
ANN STREET IRONWORKS, BELFAST; and
97 NEW BOND STREET, LONDON, W.

SUPERIOR TO ANYTHING IN THE MARKET.



Sectional Drawing of Telescopic Conductor.

AVERAGE ANNUAL SALE, 600 DRILLS.



THE "ECLIPSE" AND "NON-PAREIL" CORN DRILLS

CONTAIN the most recent and Valuable Improvements. VERY SIMPLE, LIGHT OF DRAUGHT, MODERATE IN PRICE, and dispense with various extras.

THE PATENT

TELESCOPIC CONDUCTORS

NEVER BLOCK, and being connected at their upper ends to the Box, and at their lower ends to the coulter cheeks, nothing can intercept the passage of the Seed to the Coulters, as no wind or wet can get into the Conductors.

THE REVERSIBLE DELIVERY BARREL

GIVES a much larger range of quantity than the old kind, without having recourse to quick speeds, or to the use of small cogwheels.

Illustrated Catalogues forwarded Post Free on application to

JAMES SMYTH & SONS,
MANUFACTURERS OF CORN, SEED, AND MANURE DRILLS,
Peasenhall, **SUFFOLK**; Witham, **ESSEX**;
and **PARIS**, Rue Lafayette, 160.

STEAM THRASHING MACHINES.

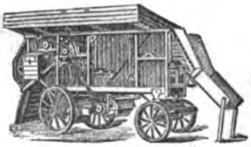
WITH OR WITHOUT PATENT COMBINED SELF-FEEDER AND GUARD.

NALDER & NALDER have during the last ten years had awarded them, for Thrashing Machines, TWENTY separate Gold and Silver Medals and Prizes, as also TEN others when coupled with the Engines of BROWN & MAY.

Single Blast, Double Blast, or Finishers, from 2½ to 10-horse power, in 33 various sorts and

NALDER AND NALDER (Ltd.)

English, French, & German Catalogues. Engineers, Shippers, & Agents Supplied.



Wantage, England.

STEAM PLOUGH ROPES,

MADE OF BEST HARD STEEL WIRE, SPECIALLY PREPARED FOR THE PURPOSE.

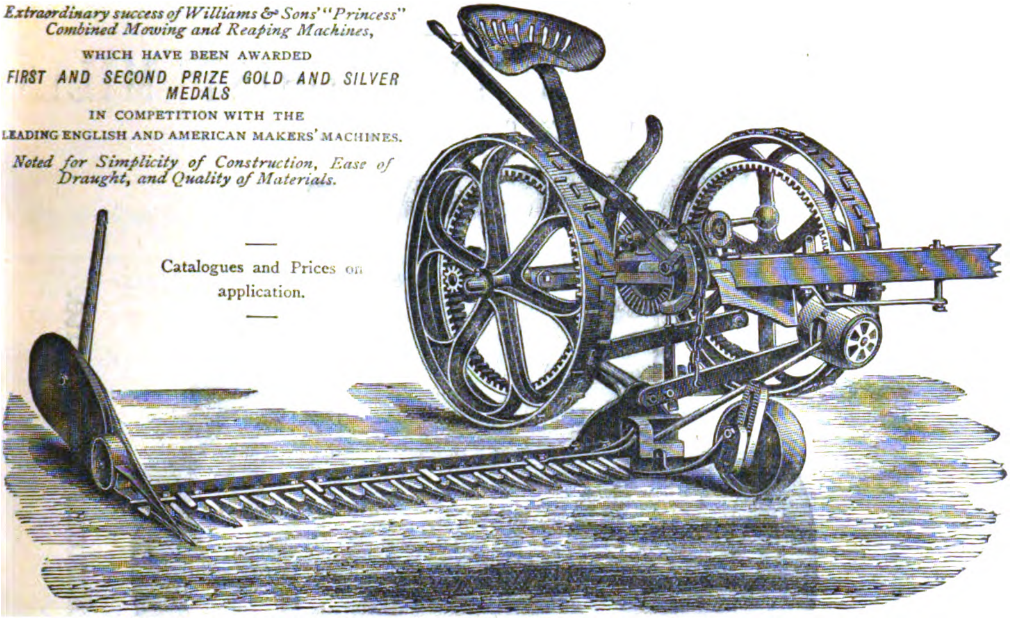
WILKINS & WEATHERLY, Manufacturers,
39 WAPPING, LONDON, E.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

JOHN WILLIAMS & SON, Phœnix Ironworks, Rhuddlan, near Rhyl,
MANUFACTURERS OF
Chaff-Cutters, Root-Pulpers & Slicers, Oil-Cake Mills, Horse-power Works, Clod Crushers, Land Rollers,
Single and Double-Row Turnip Drills, Mangling and Wringing Machines, Pig Troughs, Mowing and Combined Mowing and Reaping Machines, &c.,

Extraordinary success of Williams & Sons' "Princess" Combined Mowing and Reaping Machines,
WHICH HAVE BEEN AWARDED
FIRST AND SECOND PRIZE GOLD AND SILVER MEDALS
IN COMPETITION WITH THE
LEADING ENGLISH AND AMERICAN MAKERS' MACHINES.
Noted for Simplicity of Construction, Ease of Draught, and Quality of Materials.

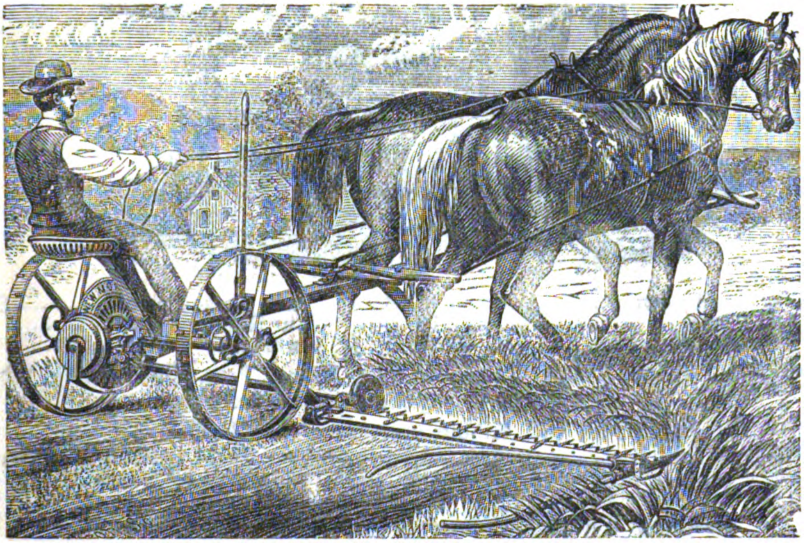
Catalogues and Prices on application.



ADRIANCE, PLATT, & CO.'S

"BUCKEYE."

LIGHTNESS OF DRAUGHT UNEQUALLED.



SIMPLICITY OF CONSTRUCTION UNSURPASSED.

MOWERS, SELF-DELIVERY REAPERS, AND COMBINED MOWERS AND REAPERS.

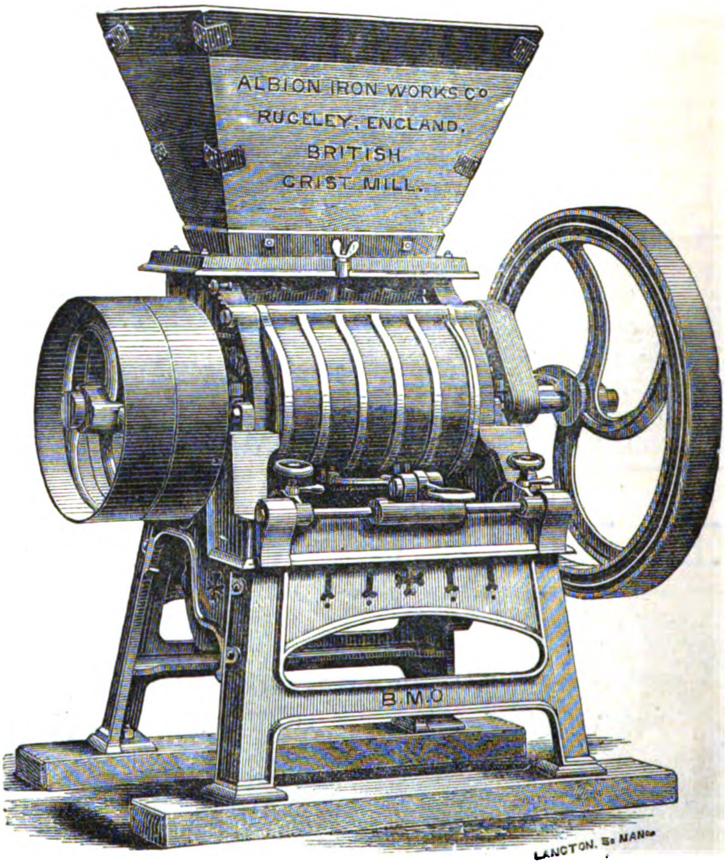
Sole Importers for Great Britain—J. & H. KEYWORTH & CO., Liverpool.

For Classified List of Advertisers, see page 64 of Advertising Sheet

THE ALBION IRON WORKS CO.,
RUGELEY, STAFFORDSHIRE.

PRIZE MEDAL BRITISH GRIST MILLS,
MADE IN SIX DIFFERENT SIZES.

Fitted with Safety Concave.



Speed, 300 revolutions per minute.

Prices				
For Hand Power	£5 5 0		Three Horse Power	£15 0 0
One Horse "	7 10 0		Four Horse "	20 0 0
Two Horse "	12 10 0		Six Horse "	28 0 0

These Mills will Grind, Kibble, Crush, or Split Beans, Peas, Oats, Barley, Wheat, and Maize, to any required sample.

The Large Mill will Kibble upwards of 100 bushels per hour.

Each Mill is fitted with a safety arrangement which will allow any foreign substance mixed with the grain, such as stones, or small pieces of iron, &c., to pass through the Mill without the slightest injury to the chilled grinding surfaces, or damage in any respect to the Mill.

Samples of Work done, Testimonials, &c., sent Post Free on application.

The ALBION IRON WORKS COMPANY are Manufacturers of Patent Self-acting Horse Rakes, Patent Chaff-Cutters, and Oil-cake Mills, Pony Gears, Horse Gears, Root Pulpers and Cutters in single, double, and treble action; R. A. S. E. First Prize Cheese Presses and Curd Mills, Ploughs, Harrows, Clod Crushers, Land Rollers, Horse Hoes, Grubbers, Cultivators, &c., &c.

Illustrated Catalogues on application.

THE CHAIN HARROW.

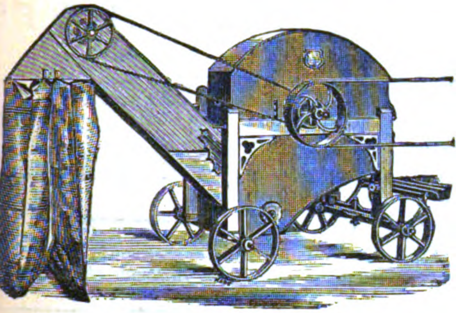
SIMPLE, EFFECTIVE, INEXPENSIVE.

MADE BY DENTON'S PATENTED MACHINERY.

Address—HENRY DENTON,
ST PETER'S WORKS,
WOLVERHAMPTON.

Prices—One Horse, 35s.; Two Horse, 60s. **Carriage paid to any Railway Station in England or Scotland.**

TWO PRIZE MEDALS—PARIS EXHIBITION, 1878.



CARSON & TOONE,

WILTSHIRE FOUNDRY, WARMINSTER,
WILTS.

CANTERBURY PRIZE CHAFF ENGINES.

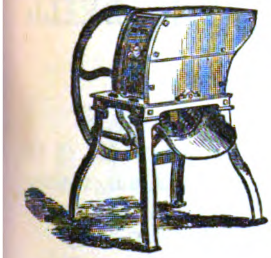
WITH IMPROVEMENTS. PATENTED 1872.

FOR STEAM POWER. (Stop and Reverse Action.)

R.A.S.E. only Prize at Canterbury. Highly commended at Bury and Oxford.

Prices—No. 1AA, £16. 16s.; No. 1A, £15. Portable, £21 and £19, 10s. With Bagging Apparatus, £28 and £26, 10s.; with Sifter, £10, 10s. extra.

For Horse or Hand-power, No. 3A, stop and reverse, £11. Ditto 1C, £8, 10s. For Hand-power, the best of their class, from £6 to £2, 10s.



MOODY'S PATENT PRIZE TURNIP CUTTERS.

Nos. 1 and 2, with CARSON & TOONE'S IMPROVEMENTS.

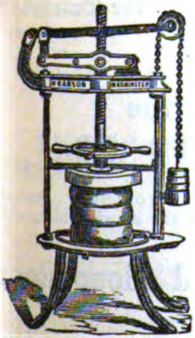
Prices—£4, 10s. and £4, 15s.; wheels and handles, £5, 10s.; for steam power, £5, 10s. Have received many prizes and commendations from the R.A.S.E. and other societies. Cut more rapidly than any other, separate the dirt from the clean slices, and are very durable.

HORSE GEARS.

Suitable for driving Chaff-cutters, Corn Mills, and Root-cutters. Two-horse, £15, 15s. One-horse, £9.

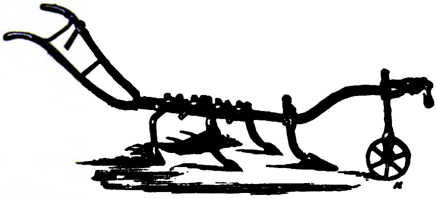
PRIZE CHEESE PRESSES.

Prize Medal, Paris, 1878; and Honourable Mention, London, 1862, and Paris, 1867; and Five First Prizes. Prices from £3 to £10. Liliput, £2, 12s. 6d.



PRIZE HORSE HOES.

Prize Medal, Paris, 1878, and Eight First Prizes. Prices—£3, 10s. to £4, 17s. 6d.

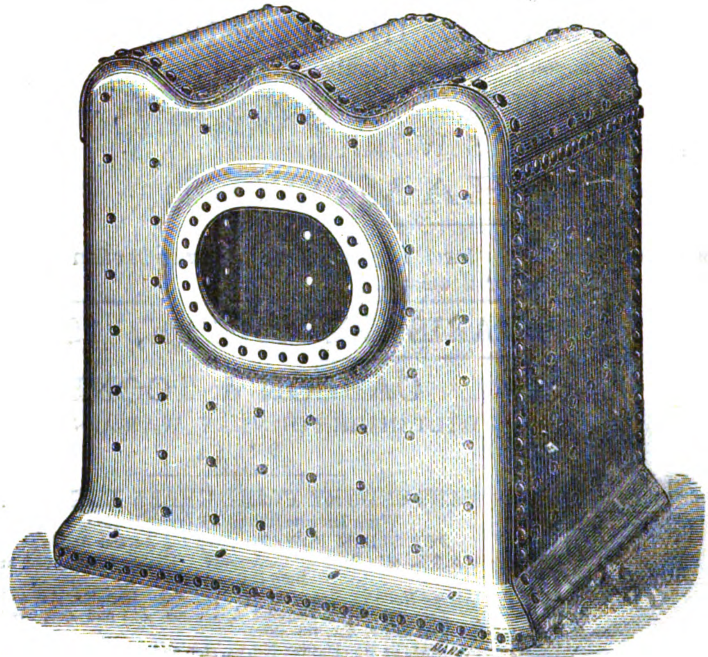


CARSON & TOONE'S PATENT AUTOMATIC LAMB CREEPS.

New principle, spring action, adjustable, safe, and humane. Prices—£1, 12s. 6d. and £1, 17s. 6d.

Illustrated Catalogues free on application.

RICHARD GARRETT & SONS



LEISTON WORKS,
SUFFOLK.

PORTABLE STEAM ENGINES.

THRASHING MACHINES

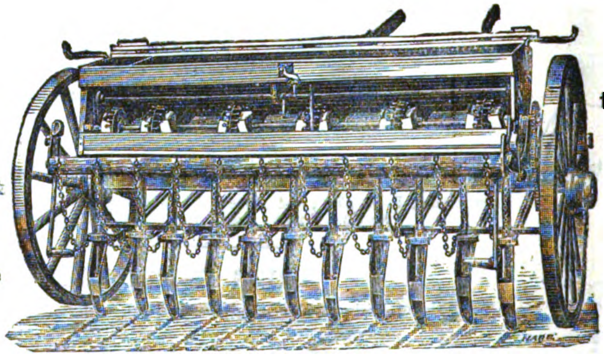
DRILLS.

HORSE HOES.

Catalogues on application as above.

KELL'S

PATENT BRITISH ECONOMICAL STEEL LEVER DRILL.



Has been awarded the Three Silver Medals of the Royal Cornwall, Worcestershire, & Shropshire Agricultural Societies for the best Corn Drill;

Also the Prize of the Glamorganshire Agricultural Society as a One-horse Drill for Turnips.

One Hundred Per Cent. is Saved by Using the

PATENT BRITISH ECONOMICAL STEEL LEVER DRILL,

As it is worked with less than half the number of horses and men required for the ordinary make of Drills. Agriculturists, before purchasing any other Drill, should see the testimony of those who have used the above, which, with Price Lists, can be obtained on application to the Makers,

KELL, MEATS, & CO., Ross, Herefordshire; and Gloucester;

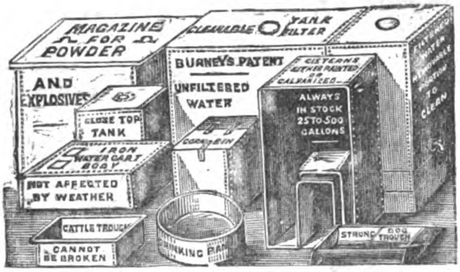
OR ANY RESPECTABLE IMPLEMENT AGENT.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

ALL GOODS MADE WITH

BURNEY'S PATENT SOLID CORNERS

ENTERED AT STATIONERS' HALL.



BURNEY & CO.,

MILLWALL DOCKS, LONDON, E.,

SOLE MAKERS OF SHIPS' TANKS TO THE ROYAL NAVY.

ONLY HOLDERS OF PRIZE MEDALS FOR CISTERN AND CATTLE TROUGHS WITH REGISTERED SAFE EDGE.

NOTE.—The Lords of the Admiralty have ordered all Royal Navy Tanks to be made with BURNEY'S PATENT CORNERS; all Tanks at these Works made with the same.

To Country Gentlemen, Owners of Property, Farmers, Engineers, Implement Manufacturers, &c., &c.

Contractors to H.M. Government and the India Board.

PEACOCK & BUCHAN'S NUMBER 3 INNOCUOUS COMPOSITION PAINT.

PRIZE MEDAL AWARDED.
AGRICULTURAL SOCIETY OF NEW SOUTH WALES
SYDNEY 1876

This Paint is invaluable for HOUSE PAINTING, *internally and externally*. It does not contain any White Lead or other poisonous substances.

It is mixed ready for use in hermetically-sealed tin cans from 3 lb. and upwards, and will keep for a number of years. It dries rapidly with a brilliant gloss, does not wash off, and can be applied by any unskilled person.

Their "ANTI-CORROSIVE METALLIC PAINT" is manufactured expressly for painting Iron-work of every description; resists Rust and Atmospheric influences.

For Pattern Tints of the Colours Manufactured, Testimonials, and Prices, apply to

Messrs PEACOCK & BUCHAN, SOUTHAMPTON;

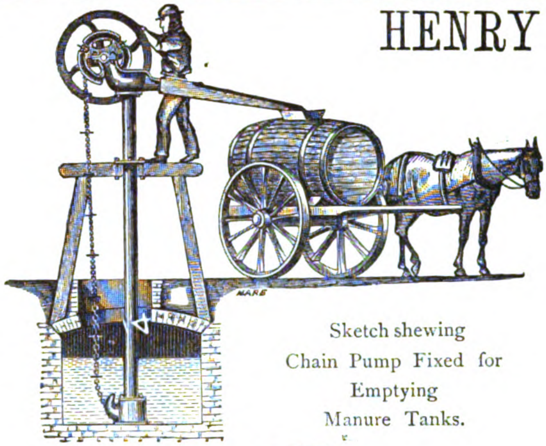
AT THEIR DEPOT, 39 UPPER EAST SMITHFIELD, LONDON;

Or to their various Sole Vendors throughout England, Scotland, Ireland, and Wales.

N.B.—BEWARE OF CHEAP AND SPURIOUS IMITATIONS, WHICH RUB OFF LIKE WHITEWASH AFTER A FEW MONTHS' EXPOSURE.

SOLE VENDORS REQUIRED FOR MANY INLAND TOWN

For Classified List of Advertisers, see page 64 of Advertising Sheet.



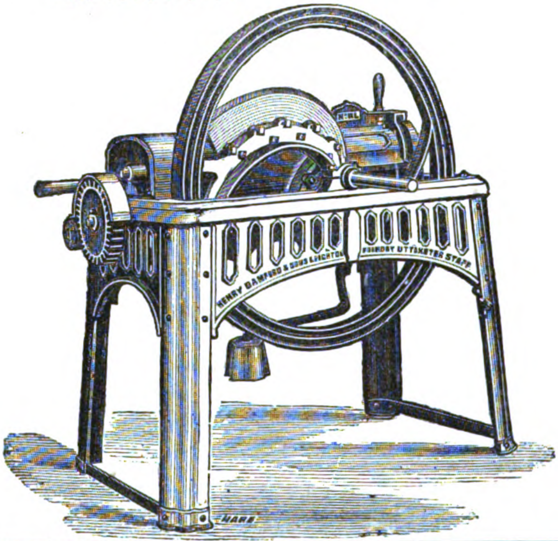
Sketch shewing
Chain Pump Fixed for
Emptying
Manure Tanks.

HENRY BAMFORD & SONS,

LEIGHTON IRON-WORKS,

UTTOXETER,

STAFF.



HENRY BAMFORD & SONS LEIGHTON FOUNDRY UTTOXETER STAFF

Prize Horse Gears, Chaff Cutters,
Cake Mills, Sheep Racks,
Patent Chain Pumps,
Lift Pumps for House, Farm,
and Garden Use,
Royal Prize Curd Mills,
Cheese Apparatus,
Cheese Presses, &c.

HORSES.

ESTABLISHED 1833.

LIEUT. JAMES'S BLISTER.—Used in Her Majesty's Cavalry Regiments, patronized by Major-General Sir Charles Dalbiac, Inspector-General of the Cavalry Forces, and highly eulogised by Professor Coleman, of the Royal Veterinary College, London, in his report to the Adjutant-General. Its great efficacy in all cases where blistering is usually applied is well known, and its celebrity has extended to all the great studs throughout the world. (*No horse will gnaw it.*)

LIEUT. JAMES'S BLISTERING OINTMENT
R. S. James
J. James

CAUTION.—The annexed label is on the top of every pot of the ORIGINAL and only GENUINE Blister.

The Messrs Barclay & Sons, 95 Farringdon Street, London, and Messrs Raimes & Co., Edinburgh, and York, and Liverpool, are now and have been Agents 45 years. The Ointment may also be had of Messrs Sutton & Co., 10 Bow Churchyard, Cheapside; W. Edwards & Son, 157 Queen Victoria Street; Lynch & Co., 171A Aldersgate Street; Evans, Lescher, & Evans, Bartholomew Close; Newbury & Son, 37 Newgate Street; Sanger & Son, 150 Oxford Street; Millard & Co., 44 Barbican; W. Mather, Farringdon Road, London; Woolley & Sons, Manchester; Messrs Boileau & Co., Bride St., Dublin; Messrs M'Master, Hodgson, & Co., Capel St., Dublin, and Cork; and all Chemists. 1 oz., 1s. 6d.; 2 oz., 2s. 9d.; and 4 oz., 5s.

Colonial Agents—*Melbourne and Wellington*—Felton & Co.; *Sydney and Brisbane*—Elliott Brothers; *Dunedin*—Kempthorne & Co.; *Auckland*—Kempthorne & Co.

Advertised in *Bell's Life* 45 years. Beware of a spurious imitation.

R. S. JAMES, 30 Years Sole Manufacturer, Stanford, Faringdon, Berks.

For Classified List of Advertisers, see page 64 *of Advertising Sheet.*

THE ROYAL AGRICULTURAL SOCIETY'S SHOW, HULL.

All the FIRST PRIZES at the last great Trials for Cultivators and Broadshares awarded to

C. CLAY, STENNARD WORKS,
WAKEFIELD,

In competition with all the best known Implements.

Unparalleled Success.

TRADE MARK

See Catalogues, Post Free, and for Particulars of

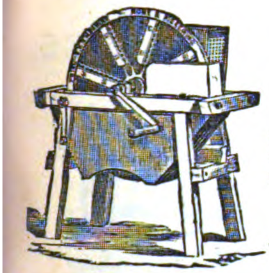
CLAY'S PATENT CHISEL HARROW
(quite a new Implement),
PATENT HORSE HOES, NORWEGIAN HARROWS, &c.

Also Pamphlet by C. C. on Spring and Autumn Cultivation.

Royal Agricultural Society of England's PRIZE BARN MACHINERY,

MANUFACTURED BY

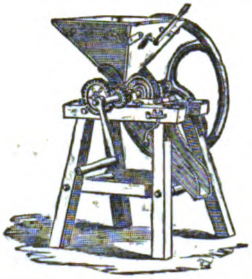
VIPAN & HEADLY,
(Late HUNT & PICKERING)
LEICESTER.



PRIZE PULPERS	from £2	12	6
PRIZE CORN CRUSHERS	„	3	0	0
PRIZE CAKE BREAKERS	„	3	3	0

Prize Chaff Cutters, Combined Machines, Turnip Cutters, Horse Gears.

Thousands are now in use. Catalogues forwarded free on application.



SECURED BY ROYAL LETTERS PATENT.

Simplicity and Effectiveness combined, saving of time and labour when time is of the great importance—in hay-time and harvest.

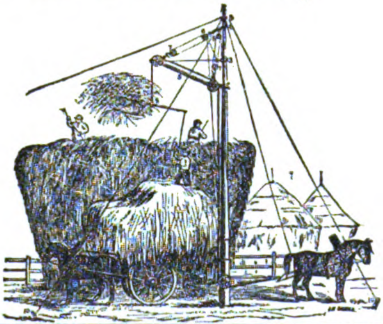
YORATH'S PATENT PORTABLE ELEVATOR,

FOR STACKING HAY AND CORN, WITH IMPORTANT IMPROVEMENT.

PRICE, complete (as recommended) £12 0 0
Iron Bars, extra............................ 0 10 0

By the use of the above Patent Horse-fork Elevator, a wagon load of Hay or Corn can be raised to the loftiest stack in 5 or 8 minutes, and will keep 6 men pitching in the field in full employ with the greatest ease to man and horse.

Three ordinary labourers can erect the Elevator in 15 or 20 minutes, and it works quite free and easy.



Inventor and Patentee—H. YORATH,
Manure and Implement Merchant,
2 WINDSOR PLACE, CARDIFF.

THIRTIETH EDITION.

WARREN'S FARMER'S ACCOUNT BOOK.

Price—Folio, for Large Farms, 8s.; Quarto, for Small Farms, and for Schools where Youths are trained for Agricultural Pursuits, 5s. Also, Folio, with Pages for a Weekly instead of a Daily Account of Labour, 7s.

Royston: JOHN WARREN. London: SIMPKIN, MARSHALL, & Co.; WHITTAKER & Co.; LONGMAN & Co.; RIDGWAY.

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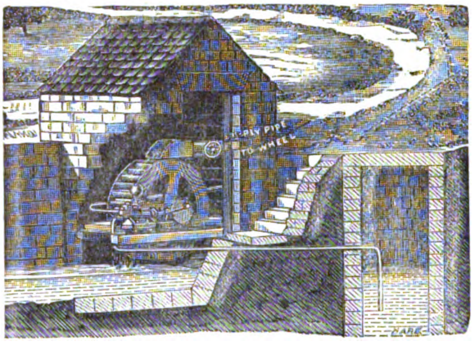
WATER SUPPLY.



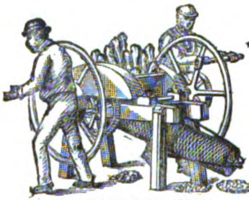
WATER WHEELS, TURBINES,
HYDRAULIC RAMS,
Improved Centrifugal Pumping Machinery,
HORSE, STEAM, & WIND-POWER PUMPS.
MANUFACTURED BY

CHARLES L. HETT,

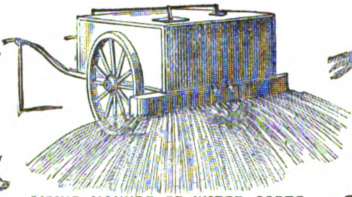
WATER WORKS ENGINEER,
ANCHOLME IRON WORKS,
BRIGG.
M. S. & L. Main Line, Nearest Shipping Ports,
Hull, and Grimsby.

Patronized by Her Majesty's Government.
AWARDED FOR

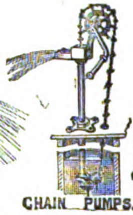
31 FIRST ROYAL AND OTHER PRIZES.



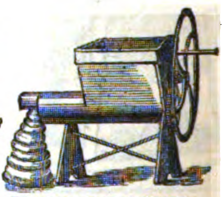
BONE OR STONE CRUSHERS.



LIQUID MANURE OR WATER CARTS.



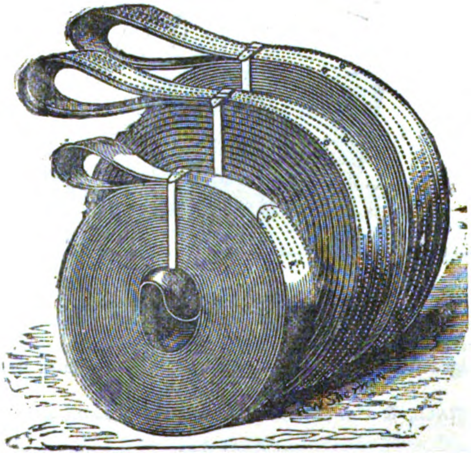
CHAIN PUMPS.



MORTAR TEMPERER.

BONE CRUSHERS (for Hand or Power)	22 to 28 gns.	CHAIN PUMPS	3½ to 20 gns.
STREET WATER VANS	46 to 50 gns.	SANITARY CARTS	20 to 28 gns.
STREET WATER CARTS	23 to 30 gns.	ROAD SCRAPERS AND SWEEPERS	3½ to 29 gns.
LIQUID MANURE CARTS	12 to 20 gns.	REVOLVING SCREENS	6 to 10 gns.
GRAVEL CRUSHERS	21 to 24 gns.	MORTAR TEMPERING MACHINES	6½ gns.

To I. JAMES & SON, TIVOLI WORKS, CHELTENHAM.



HEPBURN AND GALE,

TANNERS, AND MANUFACTURERS OF

LEATHER MACHINE BANDS

LEATHER HOSE PIPES, &c.

Their Wire-sewn "**COMPOSITE**" is the best Band yet introduced for Portable Engines; it will bear more strain than any other, and will travel straight.

EXCELSIOR COMPOUND or GLUTINOUS BELTING SYRUP,

for Preserving Leather Belting and increasing its gripping power.

"It is an invaluable compound." "Effects a very large saving of power."—*See Testimonials.*

PRIZE MEDAL, 1861, 1855, *and* 1862.

LONG LANE, SOUTHWARK, LONDON.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

THE

DUNSTON ENGINE WORKS

COMPANY,

GATESHEAD-ON-TYNE,

ARE THE SOLE MANUFACTURERS OF THE FOLLOWING WELL-KNOWN MACHINES:—

ARCHER'S
NEW PATENT STONE BREAKER,

As supplied to Sir W. G. Armstrong, C.B., and many other influential Gentlemen,
Highway Boards, &c.;

Which is the best Machine in the world for breaking Stone for Roads, and is guaranteed to break Stones more cubically and with less small than any other Machine. It is of simple construction, strong and durable.

ARCHER'S PATENT ORE CRUSHER.

For the advantages of this Machine over all others for the various requirements of the Mine Owner, Cement Manufacturer, Chemical Manufacturer, and others, see *Engineering*, December 17, 1875; also "The Science and Art of the Manufacture of Portland Cement," page 197, by Henry Reid, C.E., London, 1877.

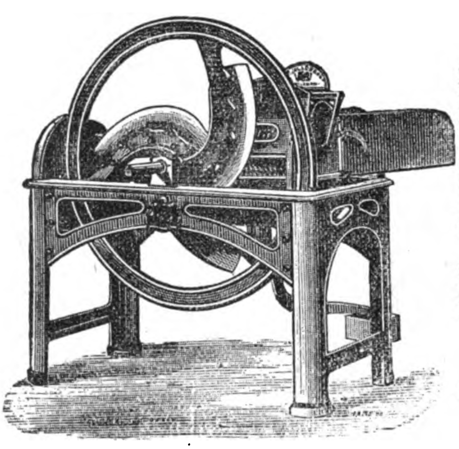
ARCHER'S PATENT BONE CRUSHER.

The only Machine that really deals successfully with Bones, Solidified Guano, and similar substances. All sizes made. One Machine, 20 inches by 7½ inches, lately crushed a large cargo of Guano at the rate of 50 tons per day.

ARCHER'S CORN CRUSHER,

For feeding stuffs, &c., is made very strong, and will do a large amount of work without requiring repairs. Strongly recommended.

London Agent—Mr THOMAS B. GIBBS,
122 DUNSTER HOUSE, MARK LANE.



THOMAS ALLCOCK,

RATCLIFF-ON-TRENT, NOTTS.

NEW PATENT SAFETY CHAFF CUTTER.

Impossible for the feeder to have his hands cut. Especially adapted for large consumers of Cut Chaff. It is made in four different sizes (11, 12, 13, and 14 in. mouth) with three Knives. The Mouth is Steel Plated, rising from 2 to 5 in. Cuts two lengths without stopping the machine, has Reverse and Stop Motion, and Patent Lever to prevent accidents to the feeder.

T. A. also makes a New Portable Chaff Cutter, exhibited at the Royal Society's Show at Liverpool. It has Three Knives, 14 in. Mouth, will Cut the Chaff, Screen out the Dust, and Bag the Chaff at the rate of 2 tons per hour.

Price List on application, and for any other size.

HORSE GEARS.

Suitable for Chaff Cutters, Corn Mills, and Root Pulpers.

One Horse, £13, 10s.; Two Horse, £15.

Drawings sent on application.

A. & J. MAIN & CO.,

MANUFACTURERS OF PATENT

CONTINUOUS BAR FENCING.

For Parks, Farms, and General Enclosures.

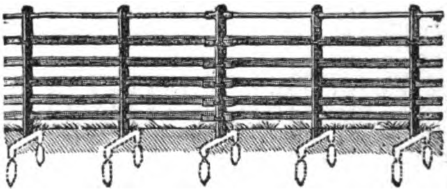
A. & J. MAIN & CO.'S

PATENT

CONTINUOUS BAR FENCING

IS UNEQUALLED.

The use of the PATENT STAPLE secures for the fence advantages obtainable in no other system.



WROUGHT IRON HURDLES,

STRAINED WIRE FENCING,

Field & Entrance Gates,

GALVANIZED WIRE NETTING.

GALVANIZED IRON ROOFING.

No Wood or Cast Iron used in Construction. Wrought Iron Columns, Wrought Iron Eaves Beams.

HAY AND GRAIN SHEDS,

CATTLE STORES,

FARM BUILDINGS,

&c., &c.

PRICE LISTS ON APPLICATION.

CLYDESDALE IRON-WORKS, POSSILPARK, } **GLASGOW,** AND **LONDON** { **108 QUEEN VICTORIA STREET, E.C.**

RICK SHEETS.

Phillips's Improved Waterproof Covers and Horse Loin Clothes are Guaranteed neither to stick nor crack.

For Full Particulars and Price Lists, address

CHARLES D. PHILLIPS,

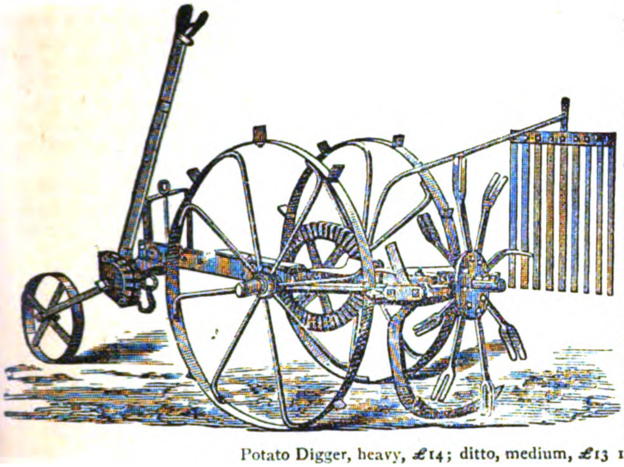
MANUFACTURER,

NEWPORT, MON.

Liberal Trade Terms.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

NEW PATENT POTATO-DIGGING MACHINE.



Simple and substantial. Neat and compact. Efficient, durable, and cheap. Powerful and perfect in work, and light and easy to draw.

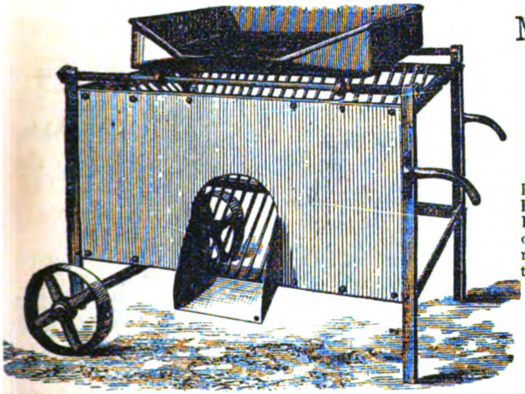
Invented and Manufactured by

ANDREW POLLOCK,
Agricultural Implement & Machine Maker,
MAUCHLINE.

In bringing out this Machine, repeated trials and experiments were made until it was proved to be thoroughly efficient in its operation. Careful consideration was given to every detail to render it light and easy to work. Simple and compact in its arrangements, the ease with which it is drawn, the quantity of Potatoes it will raise, the clean and perfect manner in which it performs its work, and the great demand which follows every one that is sent out, justify A. Pollock in recommending it as the simplest, cheapest, and most compact and perfect POTATO-DIGGING MACHINE ever offered to the public. For this season he has added considerably to the lightness of the Machine by introducing Wrought-Iron Driving Wheels in place of Cast Iron, which makes the Machine a great deal easier drawn, and lighter of itself, but heavy Cast Iron Wheels can be had to suit stiff soils if required.

Potato Digger, heavy, £14; ditto, medium, £13 10s.; ditto, light, £13.

NEW POTATO-DRESSING MACHINE.



Special Prize Medal at United East Lothian Agricultural Society Show, North Berwick, July 1878.
Silver Medal at Long Sutton Agricultural Society Show, September 1878.

ANDREW POLLOCK,
AGRICULTURAL IMPLEMENT MAKER,
MAUCHLINE,

Has much pleasure in submitting to Potato Merchants, Farmers, &c., his NEW POTATO-DRESSING or SEPARATING MACHINE for Preparing Potatoes for the Market or taking out Seconds for Seed. A. P. can, with confidence, recommend it for being the best Machine ever brought into the Market.

Price, with Double Bottom and Two different Sizes of Riddles, complete, £4 16s.
Ditto, with Single Bottom and Two Riddles, complete, £3 16s.

CARRIAGE PAID.

ROWATT'S PETROLEUM LAMPS.

Patent SPLIT-WICK ANUCAPNIC BURNERS.

WITHOUT CHIMNEY,
WITHOUT SMOKE,
WITHOUT SMELL.

The New Split-wick Arrangement increases the Capillary Attraction enormously, and thereby keeps a *full flame* till the last drop of oil is burned out; and it obviates the necessity of filling the Lamp each time before being lighted.

SPLIT-WICK SINGLE-FLAME BURNERS

Are made in Five Sizes, giving from 6 to 20 CANDLE LIGHT.

"THE DUPLEX"

Registers 35 CANDLE LIGHT.

These Facts we shall be glad to prove by the Photometer to any one calling at either of our Show-rooms.

To be had of all Ironmongers, and Wholesale only of

THOS. ROWATT & SONS,
EDINBURGH AND LONDON.

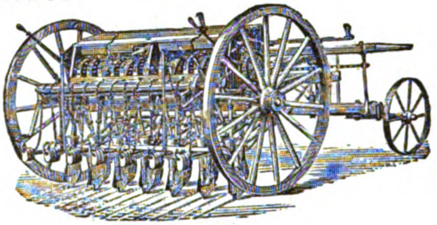
For Classified List of Advertisers, see page 64 of Advertising Sheet.

W. & C. WOOLNOUGH & CO.'S

Royal Agricultural Society's First Prize Drills and Horse Hoes.

Illustrated Catalogues of Steam Drills, General Purpose Drills, Seed and Manure Drills, Corn Drills for Light Land, Mixed Soil, and Heavy Land, and Horse Hoes of all descriptions, sent on application to W. & C. W. & Co.

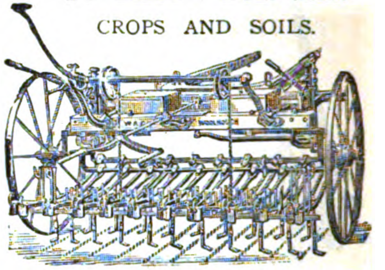
SUPERIOR IN FINISH.



EFFECTIVE IN WORK.

SUITABLE FOR ALL

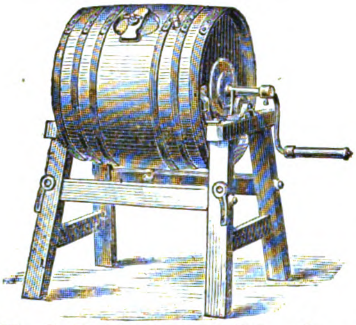
CROPS AND SOILS.



MODERATE IN PRICE.

CERES IRON WORKS, KINGSTON-ON-THAMES.

THE TRIAL OF CHURNS



By the ROYAL SOCIETY at BRISTOL has proved

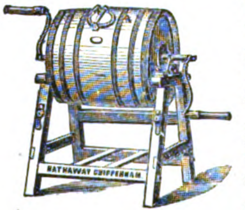
THESE TO BE SUPERIOR TO ALL OTHER BARREL CHURNS,

As, after a most exhaustive trial with Cream, they have been highly commended by the Judges, beating the Churns of Bradford, Waide, Hathaway, Lewellen, Tinkler & Co., Brown, Alway, Taylor & Wilson, Ahlborn, the Blanchard & Spain's American Churns.

For Catalogues and full Particulars apply to the Sole Manufacturers,

ROBINSON & RICHARDSON, KENDAL.

THE SUPERIORITY OF HATHAWAY'S CHURN



Was thoroughly established as the greatest Butter-producing Churn in existence at the last great trial of the Royal Society of England at Oxford, when in the **Cream** competition against all the principal Churn Makers of the Kingdom, it produced **2 lb. more** Butter than any other Churn, and was awarded the Society's Prize of £3. 10s. In the same contest it made **2 lb. 3½ oz. more** than Tinkler's Churn, **2 lb. 5oz. more** than Waide's Churn, **2 lb. 11½ oz. more** than Robinson & Richardson's Churn, and **2 lb. 2 oz. more** than Thomas & Taylor's Churn; and after a more severe trial, it again surpassed them all, taking the Prize of £3. 10s. and a high commendation from the Judges, as verified by the Society's Official Report.

Awarded the only Medal given for CHURNS at the GREAT DAIRY SHOW of 1876, held at the Agricultural Hall, London; and also the special one given by the British Dairy Farmers' Association, for Metallic Mouth Improvements. *Testimonials and all Particulars of the sole Inventor and Maker,*

G. HATHAWAY, Churn Works, CHIPPENHAM, WILTS.

HORSES.—Taylor's Condition Balls.

The Field.—"Try Taylor's Condition Balls."
Bell's Life.—"They possess extraordinary merit."
York Herald.—"An invaluable preparation."
Sunday Times.—"They are peculiarly efficacious."
John Scott.—"They are invaluable."
John Osborne.—"They are unequalled."
Samuel Rodgers.—"Send me six dozen packets."
Thomas Dawson.—"Send me a good supply."

N.B.—The same ingredients in the form of Powders. Balls, 3s.; Powders, 2s. 6d.

HORSES.—Taylor's Cough Powders, Cough or Influenza.

A cure guaranteed in ten days. All Chemists, in Boxes, 2s. 6d., with full directions.

SHEEP.—Taylor's Foot-Rot Dressings.

For Foot-Rot in Sheep, and Foul or Halt in the feet of Cattle, it has no equal. Bottles, 1s., 2s., and 3s. 6d. each.

Prepared by THOMAS TAYLOR, M.R.C.V.S., Derby.

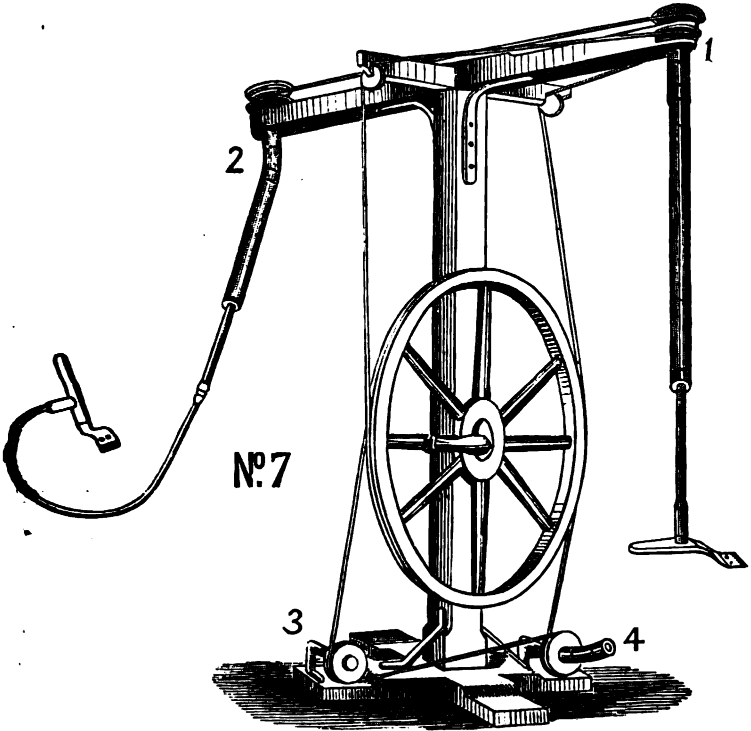
Sold by all Chemists.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

PARIS EXHIBITION, 1878.

SILVER MEDAL Awarded to

W. Clark's Case of Horse Clippers, and Apparatus for Horse Clipping and Sheep Shearing.



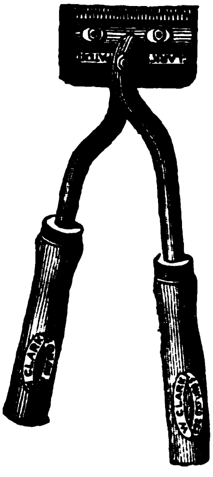
Price, with One Cutter, £14, 14s.; Two Cutters, £20.

The drawing represents a perspective view of the driving apparatus. Each turn of the wheel produces 32 cuts, and as a boy can easily produce from 80 to 90 revolutions per minute, the extraordinary speed is attained of 2,560 cuts per minute, and upwards, when one driving rod only is used, as at No. 1, but three extra rods with cutters attached can be fitted on at Nos. 2, 3, and 4, if required, so that from one to four animals can be operated upon at the same time. Or, in the case of clipping a horse, by using two driving rods, one man may clip the upper and another the lower and under parts at the same time. This will prove a great saving of time to owners of studs and Horse Companies in general.

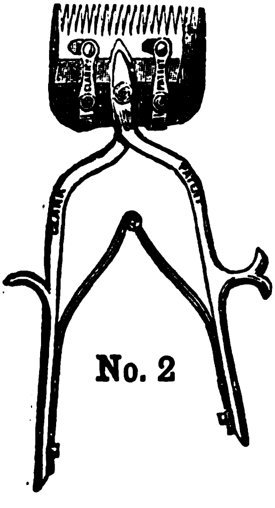
No. 1. This well-known Instrument has now been before the public for many years, and has given universal satisfaction, and is everywhere acknowledged to be by far the best, and therefore the cheapest in the market. Nos. 2 and 3 have also met with great success.

No. 2. ONE-HANDED CLIPPER, for heads, manes, quarters, and difficult parts, leaving one hand at liberty to hold the horse, thus enabling the Clipping to be performed by one man only.

No. 3. Same as No. 2, but with coarser teeth for legs and bellies, and coarse hair which would break the finer teeth. Avoiding the necessity of getting under the animal, and the consequent liability of accident to the man, and also to the machine itself.



Each of these Machines can be used for Sheep Shearing.



No. 2

W. CLARK, 232 Oxford Street, London, W.C.

FOUR MEDALS AWARDED TO

W. J. HARRISON,

208 WATERLOO ROAD, LONDON,

FOR

RAILWAY CHURNS AND DAIRY UTENSILS, &c.

EVERY ARTICLE USED IN THE DAIRY KEPT IN STOCK READY FOR USE.

W. J. H. wishes to call the attention of Dairy Farmers who send Milk by rail to the new Churns he has introduced, and was awarded the MEDAL of the BRITISH DAIRY FARMERS' ASSOCIATION at the DAIRY SHOW, 1877. It is made of extra strong Tinned Iron, and without bands and casing. That being so, it is obvious there is nothing to break or get out of order, and it is fitted with a Mallable Cast-Iron Top, which will not break or bend with ordinary usage; and the Churn is said by all to be the cleanest, strongest, and best one ever made for Railway use.

Illustrated Catalogues and Price List free on application to the Sole Manufacturer,

W. J. HARRISON, 208 Waterloo Road, London.

IMPORTANT TO AGRICULTURISTS.

GALVANIZED CORRUGATED IRON ROOFING,

For Hay and Straw Covering, Cattle Sheds, Farm Buildings, &c.

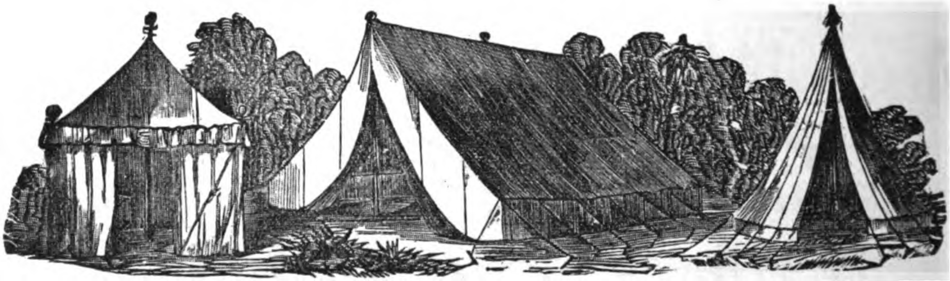
ECONOMICAL, DURABLE, AND FIREPROOF.

Estimates and Drawings on application.

DAVIES BROTHERS & CO., WOLVERHAMPTON.

WILLIAM CALDER, Sailmaker,

SAIL CLOTH, WIRE ROPE, HEMP, AND MANILLA CORDAGE STORE,
21 & 22 COMMERCIAL STREET, LEITH.



Fancy Marquee. **Emigrant's Tent.** **Bell or Cricket Tent.**

ALSO

MILITARY, EMIGRANT, AND BELL-TENT MAKER.

W. C. begs to call the attention of Volunteers and Emigrants to the above.

MARQUEES AND BELL TENTS ON HIRE.

ALWAYS ON HAND, A LARGE STOCK OF SECOND-HAND SAILS SUITABLE FOR HAY RICKS, CART COVERS, AND FARMING PURPOSES.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

[ESTABLISHED 1820.]

JARED T. HUNT & SON'S

GOD SPEED THE
TRADE — MARK.

BONE SUPERPHOSPHATE OF LIME,
WHEAT,
BARLEY, & POTATO MANURES,
PERUVIAN GUANO,
NITRATE OF SODA, &c., &c.

ALSO THE LARGEST STOCK OF

CRUSHED BONES IN THE UNITED KINGDOM,

Consisting of ½ in., ¼ in., Pulverized for Grass Lands, and Bones specially assorted for Vines.

PHOSPHO-GUANO,

RICH IN PHOSPHORIC ACID AND SOLUBLE PHOSPHATES, AND IMMEDIATELY AVAILABLE FOR FEEDING OF PLANTS.

Delivered at any Railway Station, £10, 10s. per Ton.

MESSRS JARED TERRET HUNT & SON

(LIMITED),

BOW BRIDGE BONE MILLS AND CHEMICAL MANURE WORKS,

STRATFORD, LONDON, E.;

AND

DOWNHAM MARKET, NORFOLK.

N.B.—Responsible Agents required for Districts unrepresented.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

FARMER'S MANURES,
SOLD WITH A GUARANTEE OF ANALYSIS

CHEMICAL GUANOS

Unsurpassed in fertilizing value by any other Guano. Contrasted with Peruvian and other raw Guanos have Phosphates nearly all Soluble; Ammonia Fixed; Quality both Uniform and Guaranteed. They are further prepared in three varieties (styled 'A,' 'B,' and 'C'), furnishing complete Manures in themselves without expense, or inconvenience, of admixture, for all Cereals, Grass, Potatoes, Mangolds, Hops, Top Dressing, &c.

BONE MANURES, for Turnips, &c.

SUPERPHOSPHATES,

25 per cent. to 40 per cent. SOLUBLE.

Full particulars, on application to the Local Agents, or to the Manufacturers,

THOMAS FARMER & CO.,

ESTABLISHED 1778 (AS CHEMICAL MANUFACTURERS.)

Offices:—DUNSTER HOUSE, MARK LANE, E.C. }
Works:—HALL'S WHARF, VICTORIA DOCK, E. } LONDON.

THE LINCOLNSHIRE FARMERS' ASSOCIATION.

Established 10th June 1868, for the purpose of Purchasing GENUINE PHOSPATIC MANURE of guaranteed quality, and supplying the same to its Members at COST PRICE.

COMMITTEE FOR THE CURRENT YEAR.

CAPTAIN SMITH, *Chairman.*

Mr William Little.
Major Charles Parker.
Mr Bruce Tomlinson.
Mr John H. Casswell.
Mr Joseph Scales.
Mr Henry John Seels.

Analyst and Chemical Referee—Dr. VOELCKER. *Bankers*—Messrs PEACOCK, HANDLEY, & Co.

Solicitor and Secretary—Mr CHARLES EDWARD BISSILL. *Auditor*—Mr HENRY BOYER.

Office—SLEAFORD.

SUPERPHOSPHATE OF LIME is supplied to Members from the Depots of the Association, and according to Dr. Voelcker's analysis, at *Cost Price*, and guaranteed to be put on Rail in good condition for sowing by hand, or for using with the dry drill, to contain from 24 to 26 per cent. of Soluble Phosphate, and to be delivered (free of carriage, &c.) at every Station on every Railway in the counties of Lincoln, Rutland, Nottingham, and Huntingdon, and in the surrounding parts of the counties of York, Derby, Leicester, Northampton, Buckingham, Bedford, Cambridge, and Norfolk. Members requiring delivery beyond the Association's District pay the Carriage from the nearest point of such District.

Members' Orders must be given on the proper printed form, and must state in what Lots the Manure will be required, in what Months, and at what Railway Stations.

Present Price (26 per cent. Soluble Phosphate), £3, 14s. per Ton. Bags, 5s. extra per Ton.

Registration Fee, 1s. per Ton. Payment a Fortnight before Delivery. Analysis free of cost. Entrance Free, Twopence per Acre on occupation.

The Members are now upwards of 1050, and occupy upwards of 321,000 Acres of Land.

Gentlemen desirous of joining should apply to the Secretary, Mr C. E. BISSILL, Solicitor, Sleaford, of whom the Rules, Map of District of Free Delivery, Instructions, Report of Committee, Entrance and Order Forms, &c., and all further information, may be obtained.

SLEAFORD, *October* 1878.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

EDWARD PURSER & CO.

(LONDON MANURE COMPANY)

(*Established* 1840)

SUPPLY MANURES OF THE HIGHEST QUALITY ON THE BEST TERMS.

DISSOLVED BONES.

The large amount of Phosphates (from 36 to 38 per cent., at least half of which are rendered soluble) are GUARANTEED to be derived entirely from Bone material.

CHEMICALLY TREATED GUANO,

GUARANTEED TO CONTAIN NINE PER CENT. AMMONIA.

FIXED GUANO,

GUARANTEED TO CONTAIN SEVEN PER CENT. AMMONIA.

Each Guano contains also from 20 to 22 per cent. Soluble Phosphate, and 2 to 4 per cent. Insoluble, with Magnesian and Potash Salts.

They are in fine condition, and are sent out in Bags of 1¼ cwt. each, 16 to the Ton.

ALSO,

BONE MANURES AND SUPERPHOSPHATES.

EDWARD PURSER & Co., 116 Fenchurch St., London, E.C.

ESTABLISHED 1812.

H. & T. PROCTOR,

AGRICULTURAL CHEMISTS,

CATHAY, BRISTOL,

ORIGINAL MANUFACTURERS OF SPECIALLY

PREPARED BONE MANURES

FOR GRASS, CORN, ROOT, AND OTHER CROPS;

ALSO

BONE SUPERPHOSPHATE OF LIME.

Works—CATHAY, BRISTOL.

DETAILED PRICE LISTS POST FREE ON APPLICATION.

HILLS' MANURES.

TURNIP AND MANGOLD WURTZEL MANURE,
CORN AND GRASS MANURE,
OTHER SPECIAL MANURES, AND
SUPERPHOSPHATES OF LIME
(25 TO 40 PER CENT. AND UPWARDS),

MANUFACTURED BY

F. C. HILLS & CO.,
SULPHURIC ACID, AMMONIA, AND CHEMICAL
MANURE WORKS,
EAST GREENWICH AND DEPTFORD, LONDON.

ESTABLISHED THIRTY-EIGHT YEARS.

HENRY WEBB & CO.,
THE WORCESTER CHEMICAL MANURE WORKS,
MANUFACTURERS OF
HIGH-CLASS CHEMICAL MANURES,
DISSOLVED BONES, SPECIAL DISSOLVED BONES,
BONE SUPERPHOSPHATE OF LIME,
AND
SUPERPHOSPHATES OF LIME,
Ranging from 25 per cent. to 45 per cent. of Soluble Phosphates. Other
CHEMICAL MANURES,
of good quality and in the best condition, warranted equal to any manufactured, and SOLD TO A GUARANTEED ANALYSIS.

PURE BONES, ALL SIZES.

WEBB'S Specialities in CHEMICAL MANURES (including the "COMBINED," introduced by them in 1863) are largely used in the Midland Counties, and references are permitted to most of the leading Farmers. They are supplied fine, dry, and friable, particular attention being paid to condition.

MANUFACTURERS OF
SULPHURIC ACID.

SIX SILVER MEDALS have been awarded to HENRY WEBB & CO. at various Agricultural Shows in the County of Worcester since 1871.

Laboratory and Offices—THE WORKS, DIGLIS, } WORCESTER.
Branch Office and Warehouse—ANGEL STREET, }

Applications for Agencies may be made personally or by letter addressed to the WORCESTER CHEMICAL MANURE WORKS.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

ODAMS' MANURES,

MANUFACTURED BY THE

NITRO-PHOSPHATE

AND

ODAMS' CHEMICAL MANURE CO.,

LIMITED,

Consisting of Tenant-Farmers occupying upwards of 150,000 Acres of Land.

CHIEF OFFICE—116 FENCHURCH STREET, LONDON.

WESTERN COUNTIES BRANCH—COUNTY CHAMBERS, EXETER.

Managing Director—JAMES ODAMS.
Manager and Secretary—C. T. MACADAM.
Assistant Secretary—HENRY CLAYDEN.

Particulars to be had of the Local Agents, or at the Offices, as above.

STEVENS, SON & CO.,

CHEMICAL MANURE MANUFACTURERS,

33 MARK LANE, LONDON, E.C.

WORKS—BROMLEY-BY-BOW, MIDDLESEX.

ESTABLISHED 1848.

STEVENS, SON & CO.'S SPRING AND AUTUMN SPECIAL MANURES FOR ALL CEREALS.
STEVENS, SON & CO.'S POTATO AND MANGOLD MANURES.
STEVENS, SON & CO.'S TURNIP MANURE, OR BONE SUPER-PHOSPHATE OF LIME.
STEVENS, SON & CO.'S DISSOLVED BONES.
MINERAL SUPERPHOSPHATE OF LIME.

ALL SOLD BY GUARANTEED ANALYSIS.

STEVENS, SON & CO.,

33 MARK LANE, LONDON, E.C.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

SALT FOR THE LAND.

D. BUMSTED & CO.,

36 King William Street, London Bridge, E.C.

Truck Loads Carriage Paid to any Railway Station.

Less quantities delivered to London Terminus. Price List forwarded on application, giving name of Station.

NITRATE OF SODA, ROCK SALT for Cattle, and all kinds of SALT for Agricultural, Domestic, and Manufacturing Purposes.

STORES:

LONDON AND SOUTH-WESTERN RAILWAY STATION, NINE ELMS;
BRIDGE WHARF, CITY ROAD;
110 NARROW STREET, LIMEHOUSE; AND
MIDLAND RAILWAY GOODS STATION, ST PANCRAS.

LANGDALE'S CHEMICAL MANURE COMPANY,

LIMITED,

TYNE MANURE AND CHEMICAL WORKS, NEWCASTLE-UPON-TYNE.

CHAMPION AND CHALLENGE TURNIP MANURES.
TOP-DRESSING MANURES FOR WHEAT, BARLEY, OATS, BEANS, GRASS, &c.
PHOSPHO PERUVIAN GUANO.
POTATO & MANGOLD MANURES.
AMMONIA-FIXED GUANO.
SPECIAL DISSOLVED BONES.
DISSOLVED BONES AND BONE MEAL.
DISSOLVED BONES.
SUPERPHOSPHATE.

Each Manure is Sold to a GUARANTEED ANALYSIS. All other Varieties of MANURES and RAW MATERIALS on application.

For Prices, Terms, and further Particulars apply to the Company direct; or to any of their appointed Agents in England, Scotland, and Ireland.

Application for Agencies to be made to

JOHN MOULT, Secretary,
41 MOSLEY STREET, NEWCASTLE-ON-TYNE.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

WESTERN COUNTIES

AND

GENERAL MANURE COMPANY

(LIMITED),

TORPOINT, DEVONPORT,

BONE CRUSHERS,

MANUFACTURERS OF

DISSOLVED BONE, SUPERPHOSPHATE,

AND

MANURES ESPECIALLY ADAPTED FOR POTATOES, CORN, MANGOLD, AND GRASS.

Agents wanted in Districts where not represented.

To be obtained of the Agents in various Districts, or at the Manufactory, Torpoint.

JOHN SHEPHEARD, Manager.

NATIVE GUANO,

PREPARED FROM THE SEWAGE OF AYLESBURY.

Orders not exceeding 10 cwt., 4s. per cwt.; above that quantity, £3, 10s. per ton at the Aylesbury Railway Station.

Mr. W. R. ROWLAND, of Oreslow, Bucks, reports on November 2, 1878: "I gained FIRST PRIZE this year for the best 6 acres of Swedes. The land was dressed with NATIVE GUANO."

Mr. A. P. SCRIVENER, of Western Turville, Tring, took First Prize at Wendover for Mangolds, also Sutton's 5-Guinea Cup.

Many other Testimonials, with names and addresses, can be had on application at the Offices of the Company,

SEWAGE WORKS, AYLESBURY, BUCKS.

THE FARMERS' MANURE COMPANY, LIMITED,

Having upwards of 150 Shareholders (Tenant Farmers), cultivating 80,000 acres of Land.

Factories—ROYSTON & STRATFORD.

This Company Manufactures and Sells only those Manures which are guaranteed as Genuine and Unadulterated.

DISSOLVED PERUVIAN GUANO.
CORN MANURE, DISSOLVED BONES.
BONE SUPERPHOSPHATE OF LIME.
SUPERPHOSPHATE OF LIME.
MANGOLD, KOHL RABI, AND POTATO MANURES.

GENUINE PERUVIAN GUANO, NITRATE OF SODA, RAPE, CAKE, AGRICULTURAL SALT, &c., SUPPLIED.

Particulars will be forwarded on application to

WILLIAM T. NASH, Manager,
ROYSTON, CAMBS.

GENUINE HIGH-CLASS MANURES.

THOMAS ASTLES'S
ACTON BRIDGE F.F.F. BONE MEAL

Is at once pure, clean, and rich in quality, being Manufactured only from the best selected Leg Bones.

Dr. VOELCKER states: "This Meal I find is made from clean steamed Bones, and nothing else. It is free from all adulteration, and is a **High-class Manure.**"

It contains equal to Tri-basic Phosphate of Lime	59·31 per cent.	**Dr. Voelcker's Analysis.**
" " Nitrogen	3·18 "	
" " Ammonia	3·86 "	

A Copy of Complete Analysis will be Supplied to Intending Purchasers.

THE OSSIFIC MANURE

Is a high-class compound Bone Manure suitable for all crops—leaving the land rich for after crops—also well adapted for Kitchen and Flower Gardens. Of which Dr. Voelcker writes:—

"The enclosed analytical results shew that the sample of compound Manure which you sent me for examination is rich in soluble and insoluble phosphates. The latter is present in the Manure entirely in the form of fine Bone Meal. In addition to the phosphatic constituents, the Manure contains **Nitrogenous Organic Matter, Nitrate of Soda** (equal to Ammonia 4·31 per cent.) and **Salts of Potash, Soda and Magnesia.** It is a fine, dry, well prepared, and **Intrinsically Valuable Artificial Manure.**

"Believe me, yours faithfully, (Signed) "AUGUSTUS VOELCKER."

Full Particulars of Analysis Supplied to Intending Purchasers. Prices and Terms on application.

THOMAS ASTLES, Acton Bridge Bone Mills,
Weaverham, Northwich.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

MANURES.

THE

QUEENBOROUGH CHEMICAL CO.

(LIMITED)

SUPPLY MANURES OF GUARANTEED QUALITY FOR ALL CROPS.

Extensively used, with most satisfactory results, by Farmers in Kent and other Counties, from whom first-class Testimonials have been received.

Works—QUEENBOROUGH, KENT.
Offices—18 BILLITER STREET, LONDON.

SOOT! LONDON SOOT!!

SAMUEL THOMPSON,

8 SIDNEY STREET, CITY ROAD, LONDON.
SUPPLIED AT MARKET PRICES. TERMS CASH.

PLYMOUTH CHEMICAL LABORATORY,
23d October, 1878.

I hereby certify that I have made a careful analysis of the sample of Soot you forwarded to me, and find it unusually rich in both Sulphate and Carbonate of Ammonia, together with bitumenous matter.

J. ALLEN.

P.S.—Quotation from Private Letter—"**IT IS A GRAND MANURE.**"

LEITH WOOL SALES.

MʻGREGOR & PRINGLE,

WOOL BROKERS,

EASTER ROAD, LEITH.

PUBLIC SALES EVERY SIX WEEKS.

ADVANCES MADE.

ROBERT WIGHT,

HIDE, SKIN, WOOL, AND TALLOW BROKER.

Office—SLAUGHTERHOUSES, 119 FOUNTAINBRIDGE,
EDINBURGH.

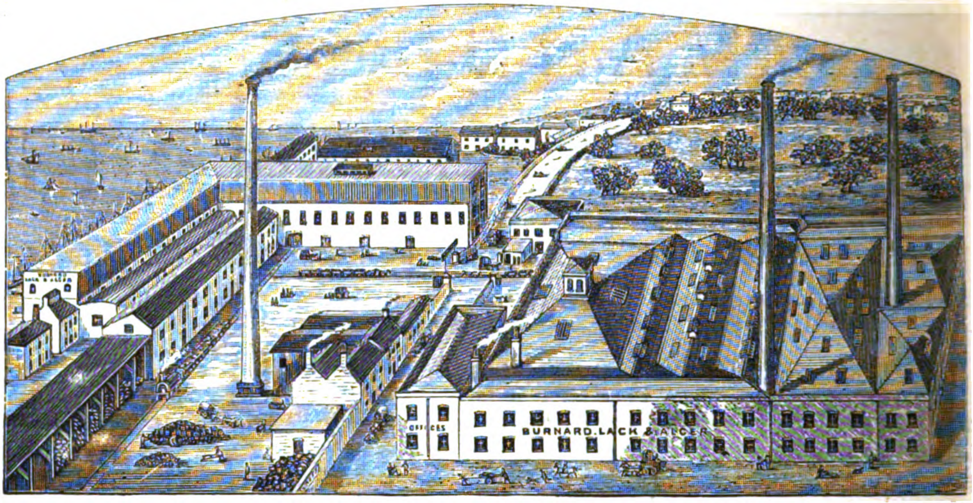
HIDES and CALF SKINS every Friday. } **SALE DAYS.** { **SHEEP SKINS every Tuesday and Friday.**

CASH REMITTED ON DAY OF SALE.

CATTLE, SHEEP, &c., consigned to my care to be Slaughtered, receive my personal attention.

Reference—NATIONAL BANK OF SCOTLAND (TOLLCROSS BRANCH).

For Classified List of Advertisers, see page 64 of Advertising Sheet.



BURNARD, LACK, & ALGER,

MANUFACTURERS OF ARTIFICIAL MANURES (Guaranteed by Analysis).

Works—SUTTON ROAD, PLYMOUTH, and CATTEDOWN, near PLYMOUTH.

The "Concentrated" Manure for Wheat, Barley, Oats, &c., and all kinds of Root Crops, Dissolved Bones, Turnip or Root Manures, Mangold, Potato, Grass, and Hop Manures; Also Sugar Beet, Sugar Cane, Coffee, and Tobacco Manures, &c. &c., for export.

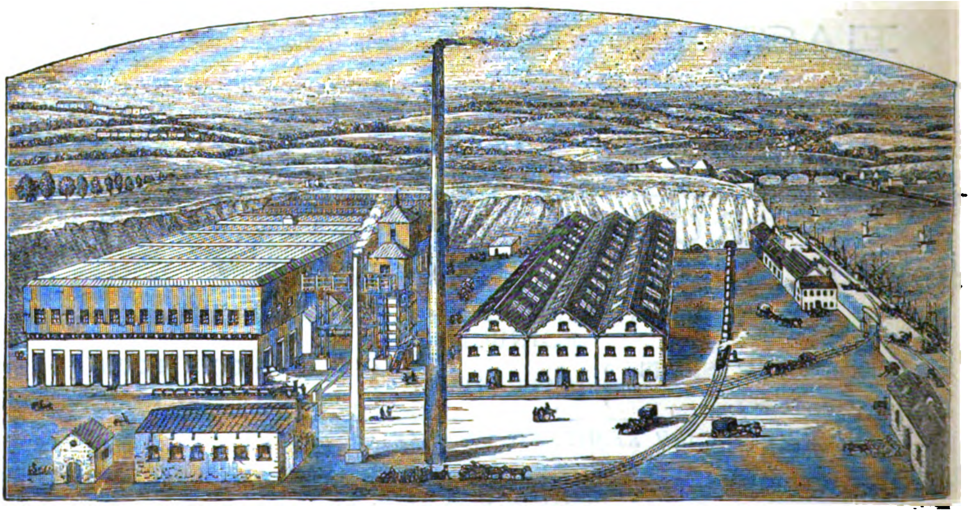
PARIS UNIVERSAL EXHIBITION, 1878.—TRIPLE AWARD—

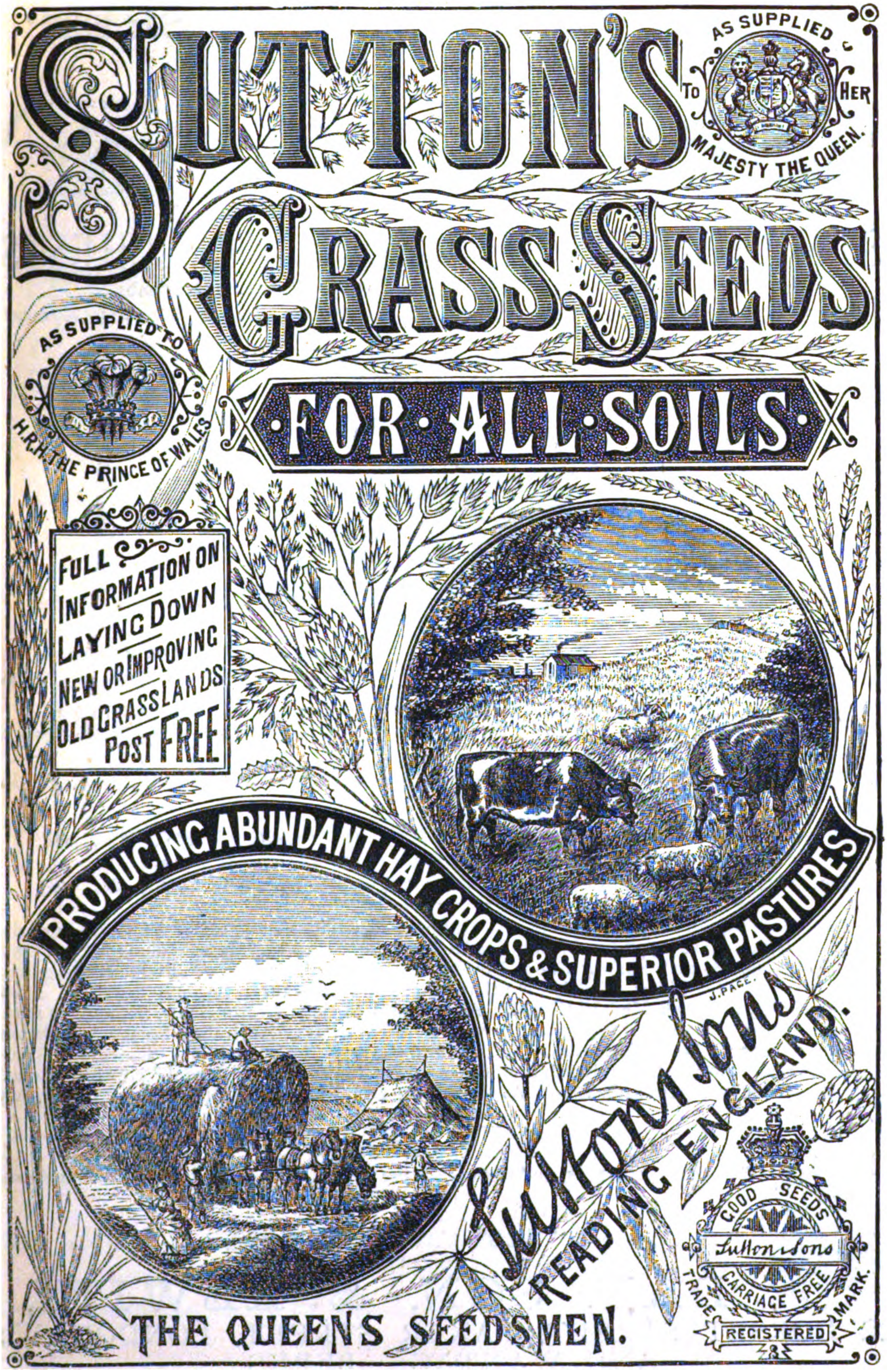
TWO SILVER MEDALS AND AN HONOURABLE MENTION.

From the "Western Morning News" of October 23, 1878.

"The awards made in the artificial Manure department of the Paris Exhibition having been completed, Messrs. Burnard, Lack, and Alger have received official intimation that they have obtained the very high distinction of a triple award, having taken two silver medals and an honourable mention. This is the only instance of a triple award in this country in this department, and there is but one double. Nor are these the only distinctions which this Firm has won. They have received the very distinguished honour of having been selected and officially invited by the Italian Government to place the whole of their interesting Paris exhibits in the Royal Museum at Turin for permanent exhibition and reference in that country—a request with which, we need hardly say, Messrs Burnard, Lack, & Alger have signified their intention to comply."

Also more than 200 PUBLIC PRIZES (open to all Manures), consisting of Gold and Silver Medals Silver Cups, and Sums of Money, have been awarded to crops grown with these high-class Manures during the past two years.





SUTTON'S GRASS SEEDS

AS SUPPLIED TO HER MAJESTY THE QUEEN.

FOR · ALL · SOILS

AS SUPPLIED TO H.R.H. THE PRINCE OF WALES

FULL INFORMATION ON LAYING DOWN NEW OR IMPROVING OLD GRASS LANDS POST FREE

PRODUCING ABUNDANT HAY CROPS & SUPERIOR PASTURES

J. PACE.

Sutton & Sons
READING ENGLAND.

GOOD SEEDS
Sutton & Sons
CARRIAGE FREE
TRADE MARK.
REGISTERED

THE QUEENS SEEDSMEN.

HORSE, CATTLE, AND SHEEP MEDICINES.

TO HER MAJESTY THE QUEEN

TO H.R.H. THE PRINCE OF WALES

By Royal Appointment.

DAY, SON, & HEWITT,

INVENTORS AND ONLY PROPRIETORS OF THE "ORIGINAL"

STOCK-BREEDERS' MEDICINE CHESTS,

For all Disorders in Horses, Cattle, Calves, Sheep, and Lambs.

Patronized by Royalty, and used for over 40 years by the principal Stock-Breeders, Horse Proprietors, and Agriculturists of the British Empire.

PRICE COMPLETE, 56s. 6d.

KEEP GOOD TWENTY YEARS.

CARRIAGE PAID TO ANY **Port or Railway Station.**

The No. 2 CHEST contains the following matchless Preparations :—

The CHEMICAL EXTRACT, for Kicks, Cuts, Wounds, Bruises, Sore Udders, all External Injuries, and Ewes Lambing.

The GASEOUS FLUID, for Fret, Colic, and Gripes in Horses, and Scour and Debility in Cattle and Sheep.

The RED DRENCHES, for Cleansing after Calving and Lambing, for Yellows, Fevers, Epidemics, and all Inflammatory Disorders.

The RED PASTE BALLS, for Conditioning Horses, and imparting a mole-like sleekness of Coat.

The "BRONCHOLINE," for Husk and Hoose in Sheep and Lambs; the "GASEODYNE," for Heaving and Paining; "Carminative Chalk," "Alcoholic Ether," &c.

Price of Chest No. 2, including "Key to Farriery," £2, 16s. 6d.,

Sent Carriage Paid. Each Article can be had separately in Boxes.

No. 1 complete Medicine Chest, with "Key to Farriery," £6, 6s. 0d.

Awarded "Certificate of Merit" by the National Agricultural Society of Victoria, Australia, Spring Exhibition, 1871; "President's Medal" at the Spalding Show, July 1872; "Silver Medal," Manchester and Salford Show, November 1874; "Silver Medal," Preston Agricultural Show, June 1875; "Silver Medal," Northamptonshire Agricultural Society, Stamford Show, September 1875; "Silver Medal," Cheshire Agricultural Society, Crewe Show, September 1875; "Special Prize," National Agricultural Society of Victoria, Australia, Spring Exhibition, November 1875; "Medal," Cheshire Agricultural Society, Chester Show, September 1876; "Silver Medal," South African Exhibition, Cape Town, 1877; "Silver Medal," Northumberland Agricultural Society, Newcastle Show, August 1877; and "Medal," North Berwick Show, July 1878.

REGISTERED TRADE MARK

CAUTION.

Beware of IMITATIONS, *and see that the name of* DAY, SON, & HEWITT *is on all Bottles and Packets.*

ESTABLISHED 1834.

DAY, SON, & HEWITT,

22 DORSET STREET, BAKER STREET, LONDON, W.;
AND WANTAGE, BERKS.

FOR COLIC, GRIPES, & GRAVEL IN HORSES,

USE THE ORIGINAL

"LUDDINGTON'S OILS,"

THE CELEBRATED

Horse, Sheep, and Cattle Medicine.

(REGISTERED.)

Is also Invaluable for DIARRHŒA or SCOUR in CALVES, FOALS, SHEEP, or LAMBS, and many other purposes, rendering it an indispensable Farm bottle. Sold by all Chemists, in Bottles, 2s. 6d. and 5s.

In a late trial in the High Court of Chancery, our claim as being the Manufacturers of the Original LUDDINGTON'S OILS was conclusively established. Actions will at once be commenced by the undersigned against any persons imitating in any way this preparation.

TOMLINSON & HAYWARD, LINCOLN.

TOMLINSON & CO.'S

BUTTER POWDER

Lessens the Time of Churning, Increases the Quantity, and Improves the Quality of Butter; Removes the Unpleasant Flavour of Cake, Turnips, Mangolds, Wild Garlic, Dead Leaves, &c.; and produces Good Firm Butter at all the Seasons of the Year.

Sold in Boxes, 3d., 6d., 1s., 2s. 6d., and 7s. 6d. each, by Chemists and Grocers.

Sole Manufacturers, TOMLINSON & HAYWARD, LINCOLN.

TICKS, LICE, SCAB, FOOT-AND-MOUTH, AND ALL CONTAGIOUS DISEASES.

THE GLYCERINE DIP,

FOR SHEEP AND LAMBS,

Is a certain preventive and cure of Scab; is also destructive to Ticks, Lice, and all Parasites infesting the Skins of Sheep and other animals; its emollient and stimulating properties greatly promote the Growth of the Wool, and being a Powerful Disinfectant, it arrests the Spread of Contagious Diseases. It does not discolour or act injuriously upon the natural yolk of the Wool, but feeds the Fleece, and maintains the natural lustre.

Sold by Agents in every Market Town. Price 6d. per lb., in various size Tins and Drums.

Sole Manufacturers and Exporters,

TOMLINSON & HAYWARD, CHEMISTS, LINCOLN.

THE GRANULAR BROWNING

IMPARTS A

Rich Colour and Superior Flavour to Roasted Meats of every Description, Chicken and Game Gravies, Soups, Beef Tea, &c.

Sold in Bottles, 1s. and 2s. 6d. each, by Chemists, Grocers, and Italian Warehouseme

Sole Proprietors and Inventors,

TOMLINSON & HAYWARD, CHEMISTS, LINCOLN.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

Important to Flockmasters and Others.

THOMAS BIGG,

Agricultural and Veterinary Chemist, by appointment to H.R.H. the late Prince Consort, K.G.,

LEICESTER HOUSE, GREAT DOVER STREET, BOROUGH, LONDON.

SHEEP-DIPPING COMPOSITION,

For the Destruction of Ticks, Lice, &c., and for the prevention of Fly, Scab, &c. It is only necessary, in giving orders, to state the number of sheep, to have the right quantity for each sent.

DIPPING APPARATUS, £4, £5, £6, and £16.

IMPORTANT CERTIFICATE FROM MR HEREPATH, THE CELEBRATED ANALYTICAL CHEMIST.

BRISTOL LABORATORY, Old Park, January 18, 1861.

SIR,—I have submitted your Sheep-Dipping Composition to analysis, and find that the ingredients are well blended, and the mixture neutral. If it is used according to directions given, I feel satisfied that while it effectually destroys vermin, it will not injure the hair roots (or "yolk") in the skin, the fleece, or the carcase. I think it deserves the numerous Testimonials published.—I am, Sir, yours respectfully,

WILLIAM HEREPATH, Sen., F.C.S., &c., &c., Professor of Chemistry.

To Mr Thomas Bigg.

PAMPHLETS FREE ON APPLICATION.

IMPORTANT TO AGRICULTURISTS.

For the Protection of Seed Corn from the Ravages of Rooks, Birds, or Vermin, "Down's Farmers' Friend" is supplied Carbolised.

UNDER THE SPECIAL PATRONAGE OF HER MAJESTY THE QUEEN,
H.R.H. THE LATE PRINCE CONSORT, H.R.H. THE PRINCE OF WALES,

And Patronised by the principal Noblemen, Landowners, and Agriculturists in the Kingdom.

DOWN'S FARMERS' FRIEND

Has stood the test of 40 years, and is acknowledged to be the safest and most effectual preventive of

SMUT IN WHEAT, BARLEY, OATS, &c.,

THE RAVAGES OF THE SLUG, GRUB AND WIRE-WORM, AND THE INCURSIONS OF ROOKS AND VERMIN,

As the testimonials and high reputation of the gentlemen whose names they bear will testify.

It will also promote the Germination and Growth of the Seed, and increase the produce of the Crop equal to a change of Seed.

A PACKET IS SUFFICIENT FOR SIX BUSHELS OF SEED, which can be dressed and fit to sow in a quarter of an hour.

Testimonials from the largest Wheat-growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.

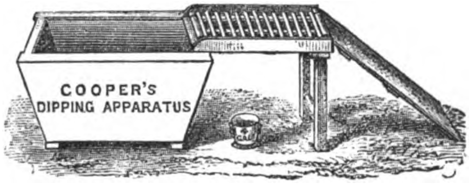
Manufactory—WOBURN, BEDS.

Wholesale Agents—Messrs LANGTON, EDDEN, HICKS, and CLARK, 230 Upper Thames Street, London.

CAUTION.—Each Packet of the FARMERS' FRIEND bears a *fac-simile* of the Inventor's Signature— Henry Down

For Classified List of Advertisers, see page 64 of Advertising Sheet.

IMPORTANT TO FLOCK-MASTERS!



COOPER'S SHEEP-DIPPING POWDER

IS THE CHEAPEST, SAFEST, AND BEST.

It dissolves in Cold Water, and should be used in preference to any other Dip

FOR TICKS, FLY, SCAB,

AND FOR ALL OTHER SHEEP-DIPPING PURPOSES.

This Dip has been in use upwards of thirty years, and has never been equalled by any other; it is of uniform strength, requires no boiling or hot water, does not stain the wool, and is equally good as a Summer and Winter Dip. It is especially recommended for Dipping Lambs, and as a cure for Scab.

Sold by Agents in every Town, in packets, 1s. 4d. each, the average quantity for Dipping 20 Sheep.

PREPARED ONLY BY

W. COOPER, M.R.C.V.S., Chemical Works,

BERKHAMSTED, HERTS.,

Who will send his Pamphlet on Sheep-Dipping and the Cure of Scab, post free, on application.

SULPHINE.

SOLE MANUFACTURERS:

Messrs WILLIAM BAILEY & SON,

Horseley Fields Chemical Works, WOLVERHAMPTON,

AND AT

Nos. 2 and 3 ABCHURCH YARD, CANNON STREET, LONDON, E.C.

SULPHINE is the most important discovery in medicine that has been made for many years. It is a clear and colourless liquid, possessing very remarkable therapeutical properties.

SULPHINE strikes at the root of numerous diseases, by destroying the germs which enter the system along with the food we eat, the beverages we drink, and the air we breathe.

SULPHINE purifies the blood from these sources of disease, by destroying the germs, or animated cells, which are carried by the circulation to every part of the system, and which propagate with amazing rapidity. It renders all the secretions healthy.

SULPHINE also stops fermentation and prevents putrefaction. It is a powerful disinfectant, and arrests the progress of all epidemics and contagious disorders. It is antagonistic to cholera, typhus, measles, scarlet fever, small-pox, and all *Zymotic* diseases

SULPHINE, by regulating the fermentation of the food in the digestive organs, is an immediate cure for flatulence and indigestion. It is a specific for chronic dyspepsia, and strikes at the root of all those evils which follow in its train—headache, heartburn, nausea, constipation, debility, &c. By this action it allows time for the food to become properly dissolved by the gastric juice.

Price, 1s. 6d. and 3s. per Bottle.

Extract from letter of THOMAS SUTTON, Esq., B.A., Cantab.—"It gives me much pleasure to testify to the merits of SULPHINE as a cure for indigestion. I had been for three years a martyr to that complaint."

From FRERE ARNOUL, of Rèdon, France.—
"Your SULPHINE has, after a few days, freed me from all painful sensations, and I certainly regained my strength as by enchantment."

"INDIGESTION CURED BY SULPHINE," Price 2d.; by Post, 3d.

BY APPOINTMENT,

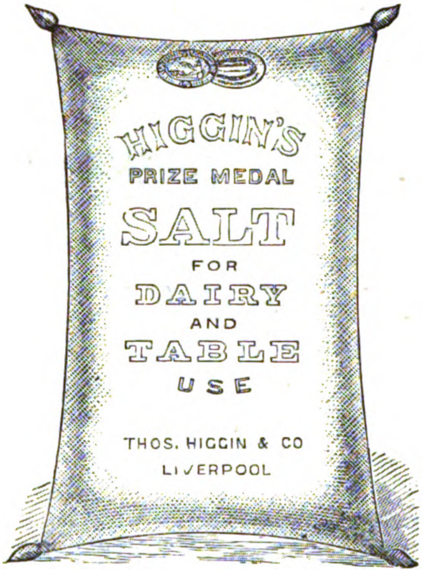
Manufacturers of Chemicals for Telegraphic, Photographic, Pyrotechnic, and other purposes.

Contractors to Her Majesty's War Office, Admiralty, Post Office, India Office, and other Government Departments; also, to the principal Railway and Telegraph Companies in Great Britain.

Great attention is given to the manufacture of Chemicals and other preparations for commercial and scientific use.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

HIGGIN'S PRIZE MEDAL DAIRY SALT.



This SALT, so extensively used and so highly prized by the AMERICAN DAIRY FARMERS, and hitherto only made for exportation, is now offered to English consumers; and the attention of ENGLISH DAIRY FARMERS is respectfully called to its merits, and trial of it invited. It is specially prepared for use in the manufacture of

BUTTER AND CHEESE.

It is *free from impurities*, of *even fine grain*, *not deliquescent*, *fine flavoured*, *not bitter*, and is in *original crystals*, *not ground or crushed*. It gained the ONLY AWARD and MEDAL for CHESHIRE SALT at PHILADELPHIA, 1876, and has been awarded a SILVER MEDAL and a BRONZE MEDAL at PARIS, 1878. The BUTTER prepared with it took the FOUR HIGHEST PREMIUMS at the NORTH-WESTERN FAIR, CHICAGO, December 1877, and it has been awarded Diplomas "*for the best Salt manufactured for Dairy and Table use*" at numerous State Fairs held this year in the various Butter and Cheese producing districts of the United States.

Works—ANDERTON, NORTHWICH, CHESHIRE.

Orders and Inquiries to be addressed to

THOMAS HIGGIN & Co.,
33 TOWER BUILDINGS WEST,
LIVERPOOL.

This Salt is prepared by a new PATENTED PROCESS, and is made up in 2 cwt., 1 cwt., and ½ cwt. Bags, and is delivered at all Railway Stations in 5 ton lots, or in smaller quantities.

WHEAT SOWING. NO MORE BIRD-KEEPING BOYS.

Neither BIRDS or ROOKS will touch the Seed Wheat or other Corn dressed with this Chemical Composition. The Success attending this Preparation has caused several WORTHLESS IMITATIONS to appear during the past few years, against which intending purchasers are respectfully CAUTIONED.

PATRONIZED BY THE LARGEST WHEAT GROWERS IN THE UNITED KINGDOM.

BEST AND CHEAPEST DRESSING FOR SEED WHEAT.

A NINEPENNY PACKET DRESSES EIGHT BUSHELS OF SEED.

D. CLARKE'S
CARBOLIZED WHEAT PROTECTOR

(Name and Label Registered under Trade Marks Act, No. 13,796)

IS A CERTAIN PREVENTIVE OF SMUT IN WHEAT,

AND THE

Destructive Attacks of any Birds, Rooks, Slug, Grub, or Wireworm,

At a Cost of less than *Twopence per Acre*, is warranted not to Clog the Drill, and ready for use in a Quarter of an Hour. No Lime or other Dressing required.

Prepared by G. B. CLARKE, M.P.S., Manufacturing Chemist, Woburn, Beds.

In Packets 9d. each, containing sufficient to Dress EIGHT BUSHELS of SEED.

Testimonial from E. BECK, Esq., Agent to H.R.H. the PRINCE of WALES.

Sandringham, Norfolk, September 4, 1878.

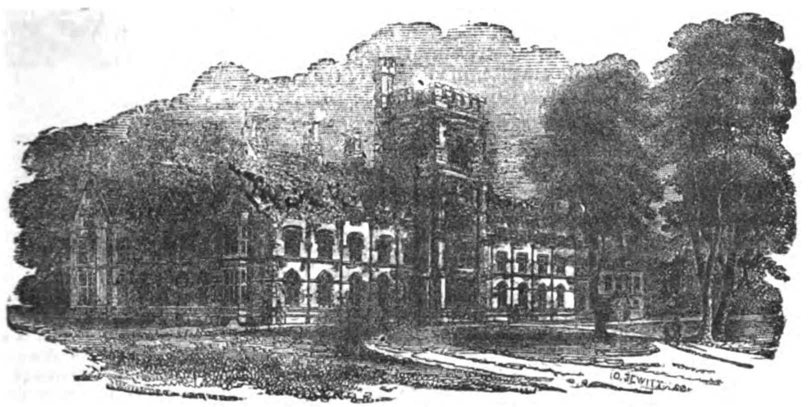
Sir,—In reply to your favour, I am pleased to say that the Wheat grown upon the Sandringham Home Farm, and Dressed with your application, IS QUITE FREE FROM SMUT. I shall use it again.—Your obedient Servant, E. BECK.

Mr G. B. Clarke.

Sold Wholesale by Messrs Barclay & Son, Farringdon Street; W. Edwards & Son, 157 Queen Victoria Street, London; Messrs Smith & Sons, and P. Woodcock & Son, Norwich; R. Fitzhugh, Nottingham; Lofthouse & Saltmer, Hull; and R. Bell & Sons, Newcastle-on-Tyne; and Retail by Chemists throughout the Kingdom.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

THE AGRICULTURAL COLLEGE, CIRENCESTER.



PATRON.

His Royal Highness The PRINCE of WALES, K.G.

PRESIDENT.

His Grace The DUKE of MARLBOROUGH, K.G.

COMMITTEE OF MANAGEMENT.

The Right Hon. The Earl of Ducie.
The Right Hon. The Earl Bathurst.
The Right Hon. Sir M. E. Hicks-Beach, Bart., M.P.
Lieut.-Col. R. Nigel F. Kingscote, C.B., M.P.
T. Sebastian Bazley, Esq.
Edward Bowly, Esq.
William John Edwards, Esq.
Ambrose L. Goddard, Esq., M.P.
George T. J. Bucknall Estcourt, Esq., M.P.
The Rev. Thomas Maurice.

PRINCIPAL.

The Rev. John Constable, M.A., Trin. Coll. Camb.

RESIDENT PROFESSORS.

Agriculture—P. H. Cathcart, M.A.C.
Chemistry—Arthur H. Church, M.A., Lincoln College, Oxon, F.C.S., F.I.C.
Assistant to Chemical Professor—C. Rawson.
Veterinary Surgery—T. W. Mayer, F.R.C.V.S., V.P. Royal Coll. of Vet. Sur., London.
Natural History—W. Fream, A.R.C.Sc., F.G.S.
Mathematics and Surveying—H. W. Lloyd Tanner, M.A., Jesus College, Oxford.
Drawing—James Miller.

The College was incorporated by Charter, granted by Her Majesty in Council, March 27, 1845, for the purpose of affording a Practical and Scientific Agricultural Education to Students from all parts of the kingdom.

DIPLOMA.

The College Diploma—which admits those holding it to the position of Graduate, under the title of Member—is obtained, at the end of a two years' course, by those who pass a satisfactory examination in Agriculture, Chemistry, and any other one subject selected by the Candidate.

Instruction in Agriculture is given by Lectures and daily Practical Classes on the Farm. The Agricultural Course of Instruction thus embraces not only scientific discussion of established methods of cultivating different kinds of Soils in different climates—of the Breeding, Rearing, and General Management of Stock, and of the Machinery—but also affords a good illustration of the cultivation of a Cotswold Farm; to which, by an arrangement made with the Tenant, the Students have free access. Each Student is expected to keep a Daily Journal of all the operations on the Farm, and to make himself thoroughly acquainted with the Accounts.

Six Scholarships—each of the annual value of £40, and tenable for four Sessions—are open to competition to all who have a Senior First-class Certificate in the Oxford or Cambridge Middle-Class Examinations, and who intend to make Agriculture their profession.

The Haygarth Gold Medal is given every Christmas, and the Holland Medal every Midsummer, and the Ducie Medal every April—the Candidates being the Students competing for the Diploma.

Charges—per Annum, to be paid Half-yearly in advance.—In-Students, £126; Out-Students, £51.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

FREEMAN'S CHLORODYNE

Is the ORIGINAL and ONLY TRUE,

TRADE MARK

Is allowed to be the greatest discovery of the present century, and is largely employed by the most eminent Medical men, in hospital and private practice, in all parts of the globe.

Is the best remedy known for *Coughs*, *Colds*, *Consumption*, *Bronchitis*, and *Asthma*.

It effectually checks those too-often fatal diseases—*Fever*, *Ague*, *Croup*, *Whooping Cough*.

It acts like a charm in *Diarrhœa*, and is the only specific in *Cholera* and *Dysentery*.

It effectually cuts short all attacks of *Epilepsy*, *Hysteria*, *Palpitation*, *Convulsions*, and *Spasms*.

It is the only palliative in *Neuralgia*, *Rheumatism*, *Gout*, *Tic Doloreux*, *Cancer*, *Toothache*, and all *Nerve Pain*.

It rapidly relieves pain, from whatever cause; allays the irritation of fever; soothes and strengthens the system under exhausting diseases; and produces quiet and refreshing sleep.

TESTIMONIALS.

The Right Honourable Earl Russell graciously transmitted to the inventor of Chlorodyne, Mr R. FREEMAN, and to the Royal College of Physicians of London, the following:—Extract of a Despatch from Acting-Consul Webb, dated Manilla, September 17th, 1864:—"The remedy most efficacious in its effects (in Epidemic Cholera) has been found to be CHLORODYNE, and with a small quantity given to me by Dr Burke I have saved several lives."—See *Lancet*, 1st December, 1864.

From CHARLES LINTON ALEXANDER, Fellow of the Royal College of Surgeons, England, &c.—"FREEMAN'S Original CHLORODYNE is a preparation that I am using many times a day; I have the greatest confidence in it, and find it of the greatest value in the treatment of Diarrhœa, Chronic Bronchitis, and Consumption."

From JOHN TANNER, M.D., L.R.C.P., M.R.C.S., L.S.A., L.M., Physician to the Farringdon Dispensary, London.—"It gives me great pleasure to bear testimony in favour of FREEMAN'S CHLORODYNE. I have prescribed it extensively, and find it in every respect far superior to any of the spurious compounds sold under the name of CHLORODYNE. In cases of Asthma, Chronic Bronchitis, the last stage of Phthisis, and the Winter Cough of the aged, I have never found any substitute or chemical combination its equal; moreover, in all cases where a sedative s required, it is a certain, safe, and agreeable remedy."

From T. D. SWALLOW, M.D., M.R.C.S. Eng., L.S.A., Surgeon to the Royal South London Dispensary, and Medical Officer to the London City Missions, &c.—"I have great pleasure in stating that I am constantly prescribing FREEMAN'S CHLORODYNE in Consumption and Asthma, and as a sedative in Cancer, and in cases of Diarrhœa and Dysentery I am daily witnessing its striking effects."

From DAVID EASTON, M.D., B.A., L.R.C.S., Medical Officer to Rhins of Galloway Poorhouse, Stranraer, Wigtonshire, Scotland.—"I consider your CHLORODYNE a valuable remedy. It has succeeded perfectly in those cases in which I have used it. In its action it is uniform, and in its effect most efficacious."

THE "TIMES," AUGUST 13, 1877.

From our own Correspondent with the Russian Army.

Okoum, July 25, 1877.—"The want of sanitary arrangements in the Russian Camp was dreadful, and had we remained there a few weeks longer, dysentery and typhoid fever would have played more havoc in our ranks than the bombs of the Turks. I myself acquired an unenviable reputation as a doctor owing to my being provided with a small bottle of **CHLORODYNE**, with which I **effected Miraculous Cures**."

From Mons. BONJOUR BARTHELEMY, Delegate of the Society for the Relief of the Wounded Decorated with the Cross of the Convention of Geneva.—Le Caillon, pres Meung-sur-Loir, France, June 18, 1873.—"I hereby attest that the CHLORODYNE manufactured by RICHARD FREEMAN, Pharmacist, of London, is the best remedy against CHOLERA and DYSENTERY, and further affirm, as Director of the Anglo-American Ambulances and of French prisoners during the war of 1870 to 1871, that a large number of those under my care were attacked with Dysentery, and that by means of his CHLORODYNE they were in a few days perfectly cured.

"(Signed) BONJOUR BARTHELEMY."

Mrs HARDING, formerly of Regency Square Schools, Kennington, gratuitously forwarded to Mr R. FREEMAN the following statement:—"In the spring of 1862, her only daughter, then 17 years of age, who was suffering with Consumption, attended with great loss of blood and emaciation of body, became an out-patient of Brompton Consumption Hospital. In June she was admitted an in-patient, and was discharged the October following as *hopelessly incurable*. After trying the advice and treatment of several eminent Physicians without benefit, she resorted to FREEMAN'S ORIGINAL CHLORODYNE, and in a short time was restored to health and strength. She was married in 1865, and is now the mother of five children.—June 18, 1877."

IMPORTANT CAUTION.—Four Chancery Suits terminated in favour of FREEMAN'S ORIGINAL CHLORODYNE, and against the Proprietors of J. Collis Browne's. Lord Chancellor Selborne, Lord Justice James, and Lord Justice Mellish condemned their proceedings, and ordered them to pay all costs of the suits.—Reported in the *Times* and other newspapers, April 29 and July 24, 1873.

None genuine without the words, "*Freeman's Original Chlorodyne,*" engraved on the Government stamp.—Sold in bottles at 1s. 1½d.; 2 oz., 2s. 9d.; 4 oz., 4s. 6d.; 10 oz., 11s.; and 20 oz., 20s. each, by all Patent Medicine Dealers, &c., and at the Laboratory, 70 Kennington Park Road, London.

Ask for FREEMAN'S, and see that the Trade Mark, the "ELEPHANT," is impressed on each Label and Wrapper, and be not persuaded to buy any substitute.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

CLARKE'S CONSTITUTION BITTERS

(Trade Mark—"Constitution Bitters")

Are invaluable for Loss of Appetite, Liver Complaints, Dyspepsia, Indigestion, Headache, General Debility, Nervousness, Pains at the Chest, Heartburn, &c. As an Invigorator of the Nerves and Muscular System, and as a remedy for Mental Depression, these Bitters are unequalled.

Price 2s. 6d. per Bottle, of all Chemists throughout the World.

Sole Proprietor—F. J. CLARKE, Chemist, LINCOLN.

TOWLE'S

PENNYROYAL AND STEEL PILLS FOR FEMALES

Quickly correct all irregularities and relieve the distressing symptoms so prevalent with the sex. Boxes 2s. 9d., of all Chemists. Sent anywhere upon receipt of stamps, by the Maker,

E. T. TOWLE, Chemist, NOTTINGHAM.

BROKEN WIND.—MANY A HORSE'S WIND has been saved by the timely use of

GOSTLING'S COUGH BALLS (or Powders).

A wonderfully efficacious remedy for COUGHS, COLDS, INFLUENZA, and LUNG DISEASE, in either HORSES or CATTLE. Sold by all Druggists, or post free of GOSTLING & SON, DISS, Norfolk.—Six Balls, 1s. 6d. ; Six Powders, 1s. 9d.

GOSTLING'S CONDITION BALLS (or Powders) for HORSES

Are excellent in cases of INDIGESTION, LOW CONDITION, SWELLED LEGS, CRACKED HEELS, HIDEBOUND, &c. Hundreds can testify to their efficacy. GOSTLING'S CONDITION BALLS are, moreover, most useful for Cattle. Bullocks thrive faster and "do" better with an occasional dose of these Balls (*or Powders*). Six Balls, 2s. 6d.; Six Powders, 2s. 9d. Sold by all Druggists, or post free of GOSTLING & SON, DISS, Norfolk.

GOSTLING'S PIG POWDERS

Are useful in almost every ailment of SOWS, and PIGS of all ages. They act as a preventative of Milk Fever and Garget, promote the health and well-doing of growing Pigs, and greatly facilitate the fattening of Pigs. Sold in Packets of 5 for 1s., or 15 for 2s. 6d., of all Druggists, or post free of GOSTLING & SON, DISS.

LAMPS, OILS, AND CANDLES,

GAS LUSTRES, HALL LAMPS, AND BRACKETS.

SMITHS & CO.

Beg respectfully to inform Parties Furnishing that they have an ENTIRELY NEW STOCK of GAS LUSTRES and OIL LAMPS of Newest Designs, at Strictly Moderate Prices.

Agents for STRANGE'S CELEBRATED A1 CRYSTAL OIL, the Finest Burning Oil in the Kingdom.

PURVEYORS OF LAMPS AND OILS TO THE QUEEN.

89 GEORGE STREET, Edinburgh (Formerly No. 1 Blair Street).

Established 1770.

POST FREE, SIX PENNY STAMPS.

ADVICE and INSTRUCTIONS for the INVALID in SEARCH of HEALTH.

With certain Remedies for MELANCHOLIA, Nervous Prostration, Debility, Impaired Digestion, &c.; their Alleviation and Cure by this new and simple process.

J. WILLIAMS, P.M.V., 22 Marischal Street, Aberdeen.

NEW WORK OF VITAL INTEREST.—*POST FREE, SIX PENNY STAMPS,*

From J. WILLIAMS, No. 22 Marischal Street, Aberdeen.

A LONG AND HEALTHY LIFE.

CONTENTS:

1. Medical Advice to the Invalid.
2. Approved Prescriptions for various Ailments.
3. Sleep : Nature's Medicine.
4. Phosphorus as a Remedy for Melancholia, Loss of Nerve Power, Depression, and Debility.
5. Salt Baths, and their Efficacy in Nervous Ailments. How to obtain and use them.
6. The Coca Leaf as a Restorer of Health and Strength.

ONE BOX OF CLARKE'S B 41 PILLS

Is warranted to cure all Discharges from the Urinary Organs in either Sex, acquired or constitutional, Gravel or Pains in the Back.

Sold in Boxes, 4s. 6d. each,

BY ALL CHEMISTS AND PATENT MEDICINE VENDORS;

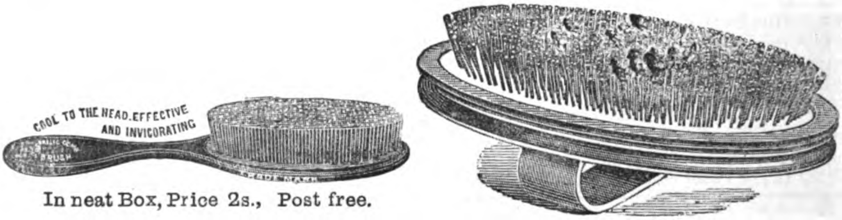
Or sent to any address for 60 stamps by the Maker,

F. J. CLARKE, Consulting Chemist, HIGH STREET, Lincoln.

Wholesale Agents—BARCLAY & SON, London;

AND ALL THE WHOLESALE HOUSES.

Ashworth's Patent "Metallic Comb-Brush."


COOL TO THE HEAD. EFFECTIVE AND INVIGORATING

In neat Box, Price 2s., Post free.

In neat Box, Prices, for Horses, 3s. 6d., Cattle, 3s., Dogs, 2s. 6d., &c., Post free.

A number of new—different sizes and styles—Gentlemen's Military, larger-sized Ladies', Students' Brushes, in Black Japan, Imitation Ivory, Lionite, &c., &c., Prices from 1s. 9d. to 5s. each.

The Brush will be found a most valuable adjunct to every nursery and ladies' toilet table. Possessing as it does the penetrating power to pierce the most luxuriant hair, it can be used when the ordinary bristle brush for its weakness would not avail, and where the comb for its rigidity would not be pleasant or desirable to use.

These Brushes are excellent cleansers for the skins and coats of animals. There is nothing at all to equal them in taking the mud off the legs of horses, cleaning out the little hollows, &c., &c. The pleasant nature of the operation may at once be proved by trying the Horse Brush in your own hair, or by the manner in which almost ANY horse will allow its use about any part of its body or legs.

"The Patent 'Comb-Brush' of Ashworth Bros., Manchester, promises not only novelty, but decided merits which entitle it to public consideration. The wires penetrate the hair like an ordinary comb, while from the manner in which they are secured to the handles, they have all the elasticity of the bristle brush, producing a most pleasant and kindly feeling. The sensation is more like that of the bristle brush when driven by steam than anything else to which it may be compared, while it is much more steady, and accomplishes the purpose of the user more certainly and minutely than the jolting steam roller of the hairdresser."—*The Christian Union*, March 8th, 1878.

"Altogether we can confidently recommend this wonderful 'metallic' brush to our subscribers' notice for its invigorating, cleansing, and strengthening qualities. A Horse Brush similarly constituted, only with the leather strap across the back, is also manufactured by this firm. No harshness can be felt by the tenderest hide by the use of this invention, and it eclipses any article yet introduced for its durability, dexterity, softness, and strength."—*The Sheffield Post*, March 19th, 1878.

"NEW METALLIC COMB-BRUSH.—Messrs. Ashworth Bros., of Manchester, have produced a nice brush for use in the stable, cowshed, and kennel. It is made of small wires fixed on a preparation of a vulcanized India-rubber cloth. Its use has a cool and invigorating effect on the body of a horse or dog, and gives a clean and glossy appearance to the coat. This brush will likely become a valuable adjunct in the stable and kennel."—*Live Stock Journal.*—Cassell, Petter, & Galpin, London.

"Colchester, Feb. 21st, 1878.—Gentlemen,—I have used your 'Metallic Comb-Brush' for my terrier dogs, and find it most useful, and I feel sure it would be equally useful for human beings and horses.—CHAS. E. ADDISON, M.D., M.R.C.S."

"Twyford, Berks.—Gentlemen,—Your 'Metallic Comb-Brushes received. They are not only elegant and cleanly, they are cool, delicious, and a positive luxury, and I shall not fail to recommend them.—GORDON STABLES, M.D., C.M., R.N."

"The Royal Canine Hospital, 55 South Molton Street, London, W.C., Sept. 4, 1878.—Gentlemen,—You are true benefactors to our canine friends, and I have the greatest pleasure in recommending your Metallic Hair-Brushes to my numerous patrons and friends. To those who keep dogs for the show-bench, they are invaluable, the improvements in a dog's coat after four days' use being really mavellous. I shall never be without them in the hospital.—Yours faithfully, C. ROTHERHAM, Royal Veterinary Canine Surgeon."

NOTE.—Ashworth's Brushes are made entirely of plated wire (no bristles); the handles are solid. They are black japanned, which is a covering impervious to grease, water, &c. See that our name is stamped on each Brush, as inferior imitations are being sold. Send for Prospectus.

ASHWORTH BROTHERS, Ashley Lane, Manchester.

S. THOMPSON, SOOT MERCHANT,

8 SIDNEY STREET, LONDON, E.C.

For Classified List of Advertisers, see page 64 *of Advertising Sheet.*

GLENFIELD STARCH

Has for many Years been Exclusively used in the Royal Laundry.

"*The best Starch I ever used.*"—The Queen's Laundress.

"*Cleanly in use, economical, and gives a perfect stiffness and gloss difficult to excel.*" } "Milliner and Dressmaker."

"*Particularly adapted for clear starching muslins.*" } "Englishwoman's Domestic Magazine."

DINNEFORD'S MAGNESIA.

For over Forty Years the Medical Profession have approved of this pure Solution as the best remedy for Acidity of the Stomach, Heartburn, Headache, Gout, and Indigestion; and as the safest aperient for delicate Constitutions, Ladies, Children, and Infants.

DINNEFORD'S
FLUID
MAGNESIA

SOLD BY CHEMISTS THROUGHOUT THE WORLD.

CAUTION.—See that "DINNEFORD & CO." is on every Bottle and Label.

V. R.

DOMINION OF CANADA.

To CAPITALISTS, RETIRED ARMY AND NAVY OFFICERS, FARMERS, and all those who wish to engage in PROFITABLE AGRICULTURE.

IMPROVED FARMS, with Dwellings and Farm Buildings, can be purchased in **CANADA** at from **£4** to **£10** sterling per acre, or for the amount required to carry on a leased Farm in Great Britain.

The money can nearly always be paid in instalments covering several years. The leasing of farms is an exception to the general rule, as most men desire to own the land they cultivate.

There is no class to which Canada offers a better field than to the Tenant-Farmers of Great Britain and Ireland who are anxious to change their condition of leaseholders to that of owners of the soil.

Canada is so comparatively close to England (Liverpool to Quebec being the shortest sea passage to America, average 9 days), and the means of intercommunication are so numerous and expeditious, that the Dominion is now supplying the Home Market with **LIVE FAT CATTLE, HORSES, SHEEP, PIGS, FRESH BEEF, MUTTON, POULTRY, EGGS**, and **GENERAL FARM PRODUCE**, almost as readily as Ireland, and with **FAR MORE PROFIT** to the Producer. The superiority of Canadian Live Stock and Dairy Produce has now been fully established. In 1877

13,659,949 lbs. of CANADIAN BUTTER, and 35,427,157 lbs. of CHEESE, were shipped to GREAT BRITAIN;

16,055 lbs. of BUTTER, and 2,215,984 lbs. of CHEESE, to the UNITED STATES; and 1,286,688 lbs. of BUTTER to NEWFOUNDLAND.

EXCELLENT HUNTING, SHOOTING, AND FISHING.

CHEAP PROVISIONS, LIGHT TAXES, AND FREE SCHOOLS.

FREE GRANTS of **ONE HUNDRED AND SIXTY ACRES** are offered in the Splendid Prairie Lands of **MANITOBA**, and from **ONE HUNDRED** to **TWO HUNDRED ACRES** in other parts of Canada.

Pamphlets containing full information on Canada, may be obtained Gratis, on application, to W. ANNAND, Canada Government Agent, 31 Queen Victoria Street, E.C., or at the Branch Agency, JOHN DYKE, 15 Water Street, Liverpool.

PAGE WOODCOCK'S WIND PILLS

GOOD for the Cure of **WIND ON THE STOMACH.**
GOOD for the Cure of **INDIGESTION.**
GOOD for the Cure of **SICK HEADACHE.**
GOOD for the Cure of **HEARTBURN.**
GOOD for the Cure of **BILIOUSNESS.**
GOOD for the Cure of **LIVER COMPLAINT.**
GOOD for the Cure of **ALL COMPLAINTS**
Arising from a disordered state of the STOMACH, BOWELS, or LIVER.

Sold by all Medicine Vendors, in Boxes, at 1s. 1½d., 2s. 9d., and 4s. 6d. each; or sent by post for 14, 33, or 54 stamps, according to size, by

PAGE D. WOODCOCK, CALVERT STREET, NORWICH.

DR. J. COLLIS BROWNE'S CHLORODYNE.

THE ORIGINAL AND ONLY GENUINE.

CHLORODYNE is admitted by the Profession to be the most wonderful and valuable remedy ever discovered.
CHLORODYNE is the best remedy known for Coughs, Consumption, Bronchitis, Asthma.
CHLORODYNE effectually checks and arrests those too often fatal diseases—Diphtheria, Fever, Croup, Ague.
CHLORODYNE acts like a charm in Diarrhœa, and is the only specific in Cholera and Dysentery.
CHLORODYNE effectually cuts short all attacks of Epilepsy, Hysteria, Palpitation, and Spasms.
CHLORODYNE is the only palliative in Neuralgia, Rheumatism, Gout, Cancer, Toothache, Meningitis, &c.

A FEW DOSES QUITE EFFECTUAL.

CAUTION.—The extraordinary medical reports on the efficacy of Chlorodyne render it of vital importance that the public should obtain the genuine, which bears the words, "Dr. J. Collis Browne's Chlorodyne."

Vice-Chancellor Wood stated that Dr. J. Collis Browne was undoubtedly the Inventor of CHLORODYNE; that the whole story of the Defendant Freeman was deliberately untrue.

Lord Chancellor Selborne and Lord Justice James stated that the defendant had made a deliberate misrepresentation of the decision of Vice-Chancellor Wood.

Chemists throughout the land will confirm this decision that Dr. J. C. BROWNE was the Inventor of CHLORODYNE.

From W. C. Wilkinson, Esq., F.R.C.S., Spalding:—

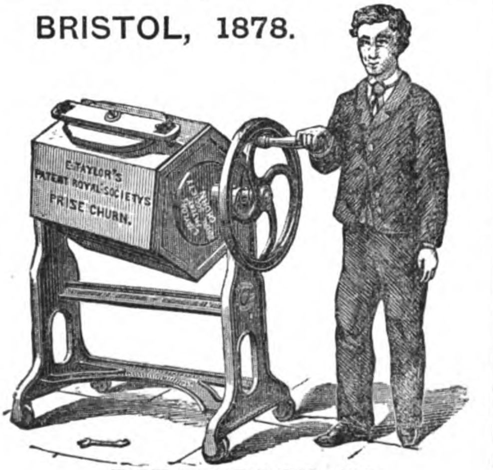
"I consider it invaluable in Phthisis and Spasmodic Cough; the benefit is very marked indeed."

Sold in Bottles, at 1s. 1½d., 2s. 9d., and 4s. 6d., by all Chemists.

Sole Manufacturer: J. T. DAVENPORT, 33 Great Russell Street, London, W.C.

THE CHURN QUESTION SETTLED!

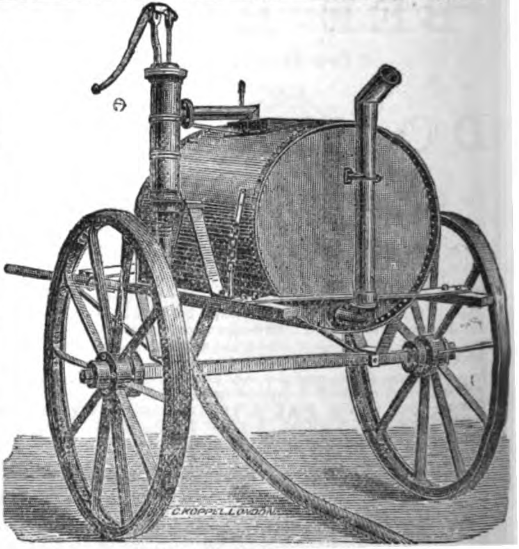
BRISTOL, 1878.



THE PRIZE OF £10
OFFERED BY THE
Royal Agricultural Society of England,
FOR THE
BEST CHURN TO MAKE BUTTER FROM CREAM,
Was Awarded at Bristol, July 1878,
AFTER a Series of TRIALS with the Leading Makers, to

E. TAYLOR'S Patent Eccentric Churn.

Price Lists on Application.
Sole Makers,
THOMAS & TAYLOR, Stockport.



OSMOND'S

CELEBRATED

WATER-CARTS AND

Patent Wrought-Iron Wheels.

LIGHT, STRONG, AND DURABLE.

Price List on Application.

Address: Newtown Ironworks, Ramsbury, Wilts

For Classified List of Advertisers, see page 64 of Advertising Sheet.

"FOR THE BLOOD IS THE LIFE."

CLARKE'S
WORLD FAMED
BLOOD MIXTURE.

Trade Mark—"Blood Mixture."

THE GREAT BLOOD PURIFIER AND RESTORER.

For Cleansing and Clearing the Blood from all Impurities, cannot be too highly recommended.

For Scrofula, Scurvy, Skin Diseases, and Sores of all kinds, it is a never-failing and permanent cure. It

Cures Old Sores,
Cures Ulcerated Sore Legs,
Cures Scurvy Sores,
Cures Cancerous Ulcers,
Cures Glandular Swellings,
Cures Blackheads, or Pimples on the Face,
Cures Blood and Skin Diseases,
Cures Ulcerated Sores on the Neck,
Cures the Blood from all Impure Matter,
From whatever cause arising.

As this mixture is pleasant to the taste, and warranted free from anything injurious to the most delicate constitution of either sex, the Proprietor solicits sufferers to give it a trial to test its value.

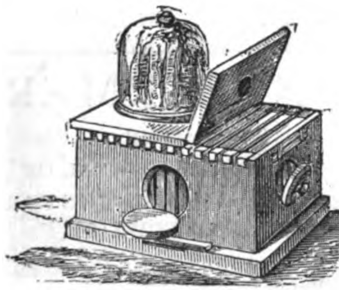
THOUSANDS OF TESTIMONIALS FROM ALL PARTS.

Sold in Bottles 2s. 6d. each, and in Cases, containing six times the quantity, 11s. each—sufficient to effect a permanent cure in the great majority of long-standing cases—by all Chemists and Patent Medicine Vendors throughout the World, or sent on receipt of 30 or 132 stamps by the Proprietor,

F. J. CLARKE, CHEMIST, APOTHECARIES' HALL, LINCOLN.

BEE HIVES.

"THE HIVE OF HIVES."



PETTITT'S METAL RACK BAR FRAME HIVES FOR EASY MANIPULATION.

PETTITT'S NEW ILLUSTRATED CATALOGUE is now ready; price, post free, three stamps.

Prize Medals were awarded to W. J. Pettitt at the Great Exhibition, 1851; Paris, 1867; Liskeard, 1870; and at the Crystal Palace, Sydenham, 1875.

Pure Ligurian Bees—imported Queens—beautiful stocks, or swarms, carefully packed and forwarded to all parts; also English Bees.

Please Address—W. J. PETTITT,
APICULTURAL INSTITUTE, DOVER.

⁂ *Apiaries*—SNARGATE ST. & HARDWICKE RD.

WILEY'S CHEMICAL ESSENCE,

FOR LAMENESS IN HORSES.

WILEY'S ESSENCE is the SAFEST cure for SPAVINS.

WILEY'S ESSENCE is a PERFECT cure for CURBS and SPLINTS.

WILEY'S ESSENCE is the best application for SPRAINS of the BACK SINEWS.

WILEY'S ESSENCE reduces CALLOUSED or HARD SWELLINGS.

WILEY'S ESSENCE is a SAFE, MILD, EFFECTIVE, CHEAP, and EASILY APPLIED BLISTER.

WILEY'S ESSENCE will not blemish or injure the Hair, however often used.

WILEY'S ESSENCE has been tested for 40 years, and is unsurpassed by any other remedy for LAMENESS in HORSES.

WILEY'S ESSENCE is prepared only by

JOHN ROOKLEDGE,
(Late WILEY)
CHEMIST, EASINGWOLD.

Sold in Bottles at 1s. 6d. and 2s. 6d. each, by all Medicine Vendors.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

THE
LONDON FARMERS' CLUB JOURNAL.

SUBJECTS DISCUSSED.

		Proposed by
1876.		
February 7.	Our Meat Supply	Mr J. Howard, Clapham Park, Bedfordshire.
March 6.	Green Crops for Sheep Feeding	Mr R. Russell, Horton Kirby, Kent.
April 3.	Local Taxation	Mr J. Trask, Orcheston, Devizes.
May 1.	The Administration of the Poor Law, especially in reference to Out-door Relief	Mr J. K. Fowler, Prebendal Farm, Aylesbury, Bucks.
November 6.	Fashion in Breeding	Mr R. Masfen, Pendeford, Wolverhampton.
December 4.	The Agricultural Labourer: his Position and Prospects	Mr C. S. Read, M.P., Honingham, Norwich.
1877.		
February 5.	Agricultural Holdings Act	S. B. L. Druce, Barrister-at-Law, Lincoln's Inn
March 5.	Providence *v.* Pauperism	Mr W. E. Bear, Thorpe, Colchester.
April 9.	Sheep: their Breeding and Management	Mr R. Russell, Horton Kirby, Kent.
May 7.	American Farming and American Agricultural Machinery	Mr J. Coleman, Riccoll Hall, York.
November 5.	The Products of the Dairy	Mr G. M. Allender, Belgrave Mansions, Grosvenor Gardens.
December 10.	The Most Profitable System of Feeding Cattle	Mr J. N. M'Adam, Hightrees, Marlborough.
1878.		
January 7.	List of Members.	
February 4.	Traction Engines	Mr T. Aveling, Rochester.
March 4.	Cart Horses	Mr F. Street, Somersham, St. Ives, Hunts.
April 1.	Farm Work in Harvest	Mr T. Rose, Melton Magna, Norfolk.
May 7.	County Government Bill (1878)	S. B. L. Druce, Barrister-at-Law, Lincoln's Inn
November 4.	Need of Greater Unity of Action in the Agricultural Interests	J. G. Edwards, Broughton, Stockbridge.
December 2.	The Paris Exhibition (Its Agricultural Teachings)	Mr J. K. Fowler, Aylesbury.

T. W. HANNAFORD, "Farmer" Office,
13A SALISBURY SQUARE, FLEET STREET, LONDON, E.C.

BARBER'S PHOSPHOR PASTE.

CATS NOR DOGS WON'T EAT IT.

DEATH TO THE RATS!!

BARBER'S PHOSPHOR PASTE KILLS RATS, BEETLES, COCKROACHES, &c.

In Tins, 1s., 2s. 6d., and 5s.
The dead vermin dry up without smell.

Testimonials.—Mr Naish, Maltster, Harnham, Salisbury, found fifty-two dead rats from 1s. jar.—Mr. Russell, Buckham Farm, Stockbridge: "I have used your Phosphor Paste and destroyed thousands of Rats; 60 lie dead from one 1s. jar."

☞ 1s. Box, per post, for 12 stamps; three for 33.

BARBER'S VERMIN KILLER

Kills Rats, Mice, &c.

1s. Packet for 12 stamps; three for 33.

Mice eat readily and die on the spot.
Mr. Simper, Cheese Market, Salisbury: "I have used your Vermin Powder, and found 63 dead mice from a 6d. Packet."

TABOR'S FOOT-ROT PASTE,

1s. 6d., 2s. 6d., and 4s. 6d. Pots, is the only acknowledged cure for that dreadful disease in Sheep.

Works—SALISBURY. ESTABLISHED 1848

Large sizes Carriage free, per Rail. Sold by Chemists, &c.

THE FARMER

(*Established* 1843)

AN ILLUSTRATED JOURNAL OF
THE FARM—THE GARDEN—THE FOREST, FIELD, AND FIRESIDE.

Price 5d.; By Post, 5½d.

The Farmer is published every Monday Afternoon, and contains full Reports of the London Corn and Cattle Markets, &c., of that day.

The Paper is posted on Monday Evening, and reaches all parts of the Kingdom on Tuesday Morning.

TERMS FREE BY POST.

Annual Subscription	£1	1	0
Half-Yearly	0	11	0
Quarterly	0	5	6

T. W. HANNAFORD,
13A SALISBURY SQ., FLEET STREET, LONDON.

For Classified List of Advertisers, see page 64 of Advertising Sheet.

ENGLISH & SCOTTISH LAW LIFE ASSURANCE ASSOCIATION.

Established 1839. Capital—One Million.

TRUSTEES.

The Right Hon. the EARL OF GLASGOW
The Right Hon. LORD MONCREIFF, Lord-Justice-Clerk of Scotland.
The Right Hon. JAMES A. STUART WORTLEY, Q.C.
The Honourable CHARLES BAILLIE.
The Honourable Mr JUSTICE FIELD.
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WILLIAM SMYTHE, Esq., of Methven.

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THE ASSOCIATION combines PERFECT SECURITY to the ASSURED, with careful SELECTION of RISKS and *Liberal* and *Immediate* PARTICIPATION in PROFITS.
NINE-TENTHS (90 per Cent.) of the PROFITS divided among the ASSURED every FIVE YEARS.
BONUS ADDITIONS, amounting to £578,826, have been made to the PARTICIPATING POLICIES.
The FUNDS are Securely Invested, and of Ample AMOUNT.
The SUBSISTING ASSURANCES EXCEED FOUR MILLIONS STERLING.
THE SEVENTH DIVISION OF PROFITS WILL TAKE PLACE AT CHRISTMAS 1880.

OFFICES
EDINBURGH.................. 120 PRINCES STREET. WILLIAM SMITH, *Manager.*
GLASGOW .... 105 ST VINCENT STREET. JOHN OSWALD, *Secretary.*
LONDON.......................... 12 WATERLOO PLACE. J. HILL WILLIAMS, *Actuary.*

THE BIRKBECK BUILDING SOCIETY'S ANNUAL RECEIPTS EXCEED FOUR MILLIONS.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH,

WITH IMMEDIATE POSSESSION AND NO RENT TO PAY, apply at the Office of the BIRKBECK BUILDING SOCIETY, 29 and 30 Southampton Buildings, Chancery Lane.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH,

With Immediate Possession, either for Building or Gardening Purposes, apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY, 29 and 30 Southampton Buildings, Chancery Lane.

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FRANCIS RAVENSCROFT, *Manager.*

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THE

LONDON FARMERS' CLUB JOURNAL.

SUBJECTS DISCUSSED.

	PROPOSED BY
1876.	
FEBRUARY 7.—Our Meat Supply	Mr J. HOWARD, Clapham Park, Bedfordshire.
MARCH 6.—Green Crops for Sheep Feeding	Mr R. RUSSELL, Horton Kirby, Kent.
APRIL 3.—Local Taxation	Mr J. TRASK, Orcheston, Devizes.
MAY 1.—The Administration of the Poor Law, especially in reference to Out-door Relief	Mr J. K. FOWLER, Prebendal Farm, Aylesbury, Bucks.
NOVEMBER 6.—Fashion in Breeding	Mr R. MASFEN, Pendeford, Wolverhampton.
DECEMBER 4.—The Agricultural Labourer: his Position and Prospects	Mr C. S. READ, M.P., Honingham, Norwich.
1877.	
FEBRUARY 5.—Agricultural Holdings Act	S. B. L. DRUCE, Barrister-at-Law, Lincoln's Inn
MARCH 5.—Providence *v.* Pauperism	Mr W. E. BEAR, Thorpe, Colchester.
APRIL 9.—Sheep: their Breeding and Management	Mr R. RUSSELL, Horton Kirby, Kent.
MAY 7.—American Farming and American Agricultural Machinery	Mr J. COLEMAN, Riccoll Hall, York.
NOVEMBER 5.—The Products of the Dairy	Mr G. M. ALLENDER, Belgrave Mansions, Grosvenor Gardens.
DECEMBER 10.—The Most Profitable System of Feeding Cattle ...	Mr J. N. M'ADAM, Hightrees, Marlborough.
1878.	
JANUARY 7.—List of Members.	
FEBRUARY 4.—Traction Engines	Mr T. AVELING, Rochester.
MARCH 4.—Cart Horses	Mr F. STREET, Somersham, St. Ives, Hunts.
APRIL 1.—Farm Work in Harvest	Mr T. ROSE, Melton Magna, Norfolk.
MAY 7.—County Government Bill (1878)	S. B. L. DRUCE, Barrister-at-Law, Lincoln's Inn
NOVEMBER 4.—Need of Greater Unity of Action in the Agricultural Interests	J. G. EDWARDS, Broughton, Stockbridge.
DECEMBER 2.—The Paris Exhibition (Its Agricultural Teachings)...	Mr J. K. FOWLER, Aylesbury.

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FRANCIS RAVENSCROFT, *Manager.*

For Classified List of Advertisers, see page 64 of Advertising Sheet.

Classified List of Advertisers.

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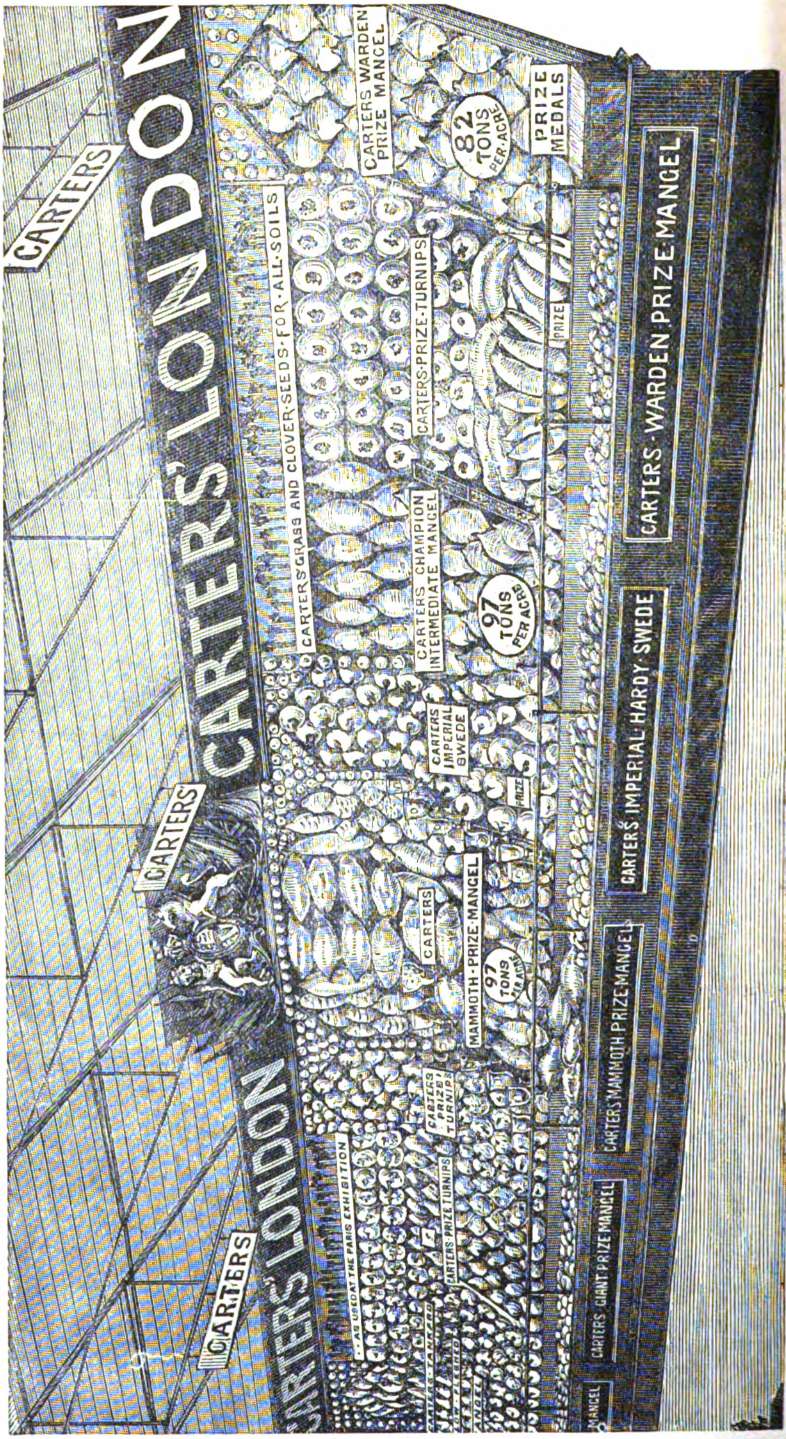
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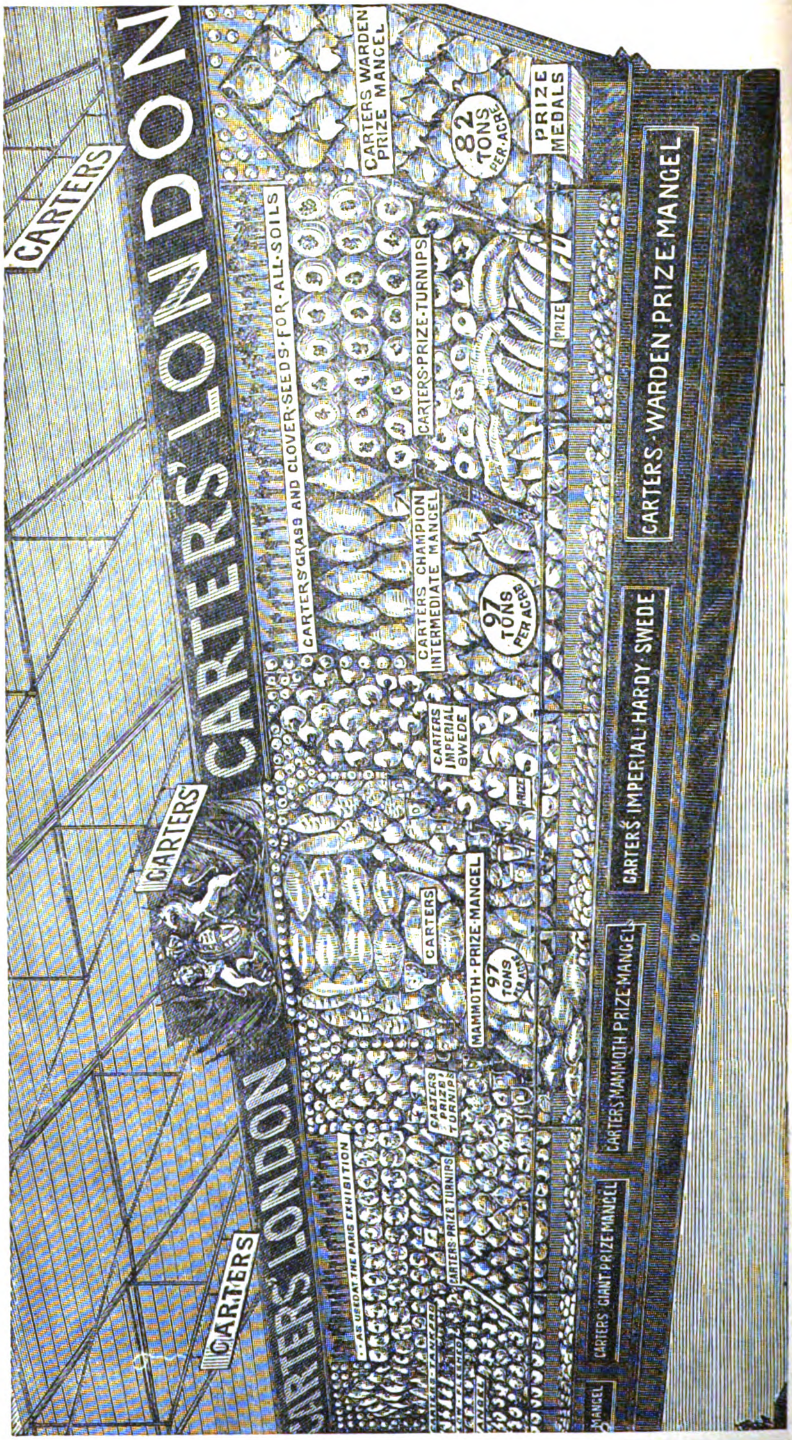
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THE

FARMER'S

AND

Country Gentleman's

Almanack

EDITED BY

H. KAINS-JACKSON

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THE

FARMER'S AND COUNTRY GENTLEMAN'S ALMANACK

Kalendarial Notes.

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ANNO MUNDI.—The year 1880 is the latter part of the 5640th and the beginning of the 5641st year since the creation of the world, according to the Jews. The year 5641 commences on September 6, 1880.

MOHAMMEDAN YEAR.—The year 1298 of the Mohammedan Æra commences on December 4, 1880, and Ramadan (Month of Abstinence observed by the Turks) commences on August 7, 1880.

THE SEASONS.

Spring Quarter begins March 20	5 A.M.	Autumn Quarter begins Sept. 22	4 P.M.
Summer ,, ,, June 21	2 A.M.	Winter ,, ,, Dec. 21	10 A.M.

ECLIPSES.

In the year 1880 there will be four Eclipses of the Sun and two of the Moon.

JANUARY 11.—*Total Eclipse of the Sun.* Invisible at Greenwich. The central eclipse begins G.M.T. 9h. 3m. afternoon. Visible over Western States of North America and the Pacific Ocean, and in the northern parts of Australia. The eclipse ends at 1h. 7m. morning, on the 12th.

JUNE 21-22.—*Total Eclipse of the Moon.* Invisible at Greenwich. Visible over East Indian Islands. Total phase begins June 22, 1h. 31m. morning. Middle of eclipse, 1h. 50m.; end of total phase, 2h. 8m. morning.

JULY 7.—*Annual Eclipse of the Sun.* Invisible at Greenwich. Visible over portions of South Africa, and Southern Indian Ocean. Begins on earth generally, 10h. 43m. A.M. At Cape of Good Hope this eclipse begins 2h. 53m., and ends 4h. 41m. P.M., one fourth of sun's disc obscured at greatest phase, 3h. 50m. P.M.

DECEMBER 2.—*Partial Eclipse of the Sun.* Invisible at Greenwich. Visible only in Antarctic Ocean. Begins on earth, 2h. 44m. A.M.; ends, 3h. 37m. A.M.

DECEMBER 16.—*Total Eclipse of the Moon.* Partly visible at Greenwich. The Moon rises at 3h. 46m. P.M., is totally eclipsed at 4h. 24m., and the earth's shadow begins to move off the moon, and clears it at 5h. 33m. P.M. Middle of eclipse, 3h. 38m. afternoon.

DECEMBER 31.—*Partial Eclipse of the Sun.* Visible at Greenwich, portion obscured 388.1000; begins 1h. 39m. P.M.; middle 2h. 35m. P.M. at Greenwich; ends 3h. 28m. P.M. Begins 37m. earlier at Dublin.

FIXED AND MOVABLE FESTIVALS, ANNIVERSARIES, &c.

Epiphany	Jan.	6	Good Friday	March	26	Advent Sunday	Nov.	28
Septuagesima Sunday	,,	25	Easter Sunday	,,	28	Christmas Day	Dec.	25
Quinquagesima Sunday	Feb.	8	Rogation Sunday	May	2	St. David's Day	March	1
Ash Wednesday	,,	11	Ascension Day	,,	6	St. Patrick's Day	,,	17
First Sunday in Lent	,,	15	Whit Sunday	,,	16	St. George's Day	April	23
Palm Sunday	March	21	Trinity Sunday	,,	23	St. Andrew's Day	Nov.	30

QUARTER DAYS.

ENGLAND.			SCOTLAND.		
Lady Day	March	25	Candlemas	Feb.	2
Midsummer Day	June	24	Whitsunday	May	15
Michaelmas Day	Sept.	29	Lammas	Aug.	1
Christmas Day	Dec.	25	Martinmas	Nov.	11

BANK HOLIDAYS.

ENGLAND.			SCOTLAND.		
Good Friday	March	26	New Year's Day	Jan.	1
Easter Monday	,,	29	Good Friday	April	11
Whit Monday	May	17	First Monday of May	May	3
First Monday of August	Aug.	2	,, ,, August	Aug.	2
Christmas Day	Dec.	25	Christmas Day	Dec.	25
Boxing Day	,,	26			

JANUARY 31 Days

THE MOON'S CHANGES.

☾ Last Quar., 5th, 6.48 a.m. | ☽ First Qr., 19th, 6.40 a.m.
● NewMoon, 11th, 10.39 p.m. | ○ Full Moon, 27th, 10.12 a.m.

			BREEDER'S KALENDAR*					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Dec.	Oct.	May	May	Mar.	
1	Th	*Circumcision*. Bnk. Holiday in Scotland.	7	13	25	1	2	1
2	F	Sun in Perigee	8	14	26	2	3	2
3	S	Sun rises 8h. 8m., sets 4h. 1m.............	9	15	27	3	4	3
4	S	2 SUNDAY after CHRISTMAS	10	16	28	4	5	4
5	M	Fire Insurance lapses on 9th...............	11	17	29	5	6	5
6	Tu	Epiphany. *Old Christmas Day*	12	18	30	6	7	6
7	W	Great Gales, U.K., 1839; U.S., 1873...	13	19	31	7	8	7
8	Th	Prince Albert Victor born, 1864	14	20	June 1	8	9	8
9	F	Napoleon III. died, 1873	15	21	2	9	10	9
10	S	Penny Post estab., 1840. Linnæus died	16	22	3	10	11	10
11	S	1 SUNDAY after EPIPHANY..................	17	23	4	11	12	11
12	M	Hilary Term begins	18	24	5	12	13	12
13	Tu	Cambridge Lent Term begins	19	25	6	13	14	13
14	W	Oxford Lent Term begins..................	20	26	7	14	15	14
15	Th	Frost Fair on Thames, 1815................	21	27	8	15	16	15
16	F	Great Frost, 1826	22	28	9	16	17	16
17	S	*St. Anthony*—Patron of Cattle	23	29	10	17	18	17
18	S	2 SUNDAY after EPIPHANY. Old 12th day	24	30	11	18	19	18
19	M	Sun after Clock, 10m. 57s.	25	31	12	19	20	19
20	Tu	Sidereal time at Noon, 19h. 57m.	26	Nov. 1	13	20	21	20
21	W	*St. Agnes*. Evacu. of Adrianople, 1878	27	2	14	21	22	21
22	Th	*St. Vincent*—a weather period	28	3	15	22	23	22
23	F	Duke of Edinburgh married, 1874	29	4	16	23	24	23
24	S	Heavy Gale in London, 1872	30	5	17	24	25	24
25	S	Septuagesima. *St. Paul's Conversion* ...	31	6	18	25	26	25
26	M	Gladstone condemned. Vote of Credit, '78.	Jan. 1.	7	19	26	27	26
27	Tu	Day 8h. 50m. long..........................	2	8	20	27	28	27
28	W	Night 15h. 5m. long	3	9	21	28	29	28
29	Th	Snowdrop flowers. Thrush sings	4	10	22	29	30	29
30	F	King Charles I. beheaded, 1649	5	11	23	30	31	30
31	S	Hilary Term ends	6	12	24	31	April 1	31

FAIRS FOR 1880.

A SELECTION OF THE PRINCIPAL FAIRS IN THE KINGDOM.

The dates of Fairs being continually changed, we do not hold ourselves responsible for any inaccuracy; every care, however, is taken to keep the list as correct as possible. Visitors from a distance should always ascertain, by letter, the exact date before making their journey. Abbreviations :—c., Cattle; h., Horses; sh., Sheep; st., Stock; pl., Pleasure.

January.

1—Stockport, cattle
2—Banbury, horses
5—Bolton, cows
5, 10—Preston, horses
17—Nottingham, cattle
20, 21—Melton Mowbray, c., pl.
20, 23—Banbury, horses
28—Stalybridge, cattle, horses, sh.
31—Chester, cattle, horses, p., sh.
31—Ripon, cattle, horses

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* **BREEDER'S KALENDAR.**—This Kalendar gives data for determining the time of gestation of the domesticated animals. For instance, if it is required to know on what day a cow will calve which has had intercourse with the bull on February 15, a glance across the page from February 15 until the column headed "Cow" is reached, will give November 27 as the probable date: and so on of all the other animals.

Memoranda.

JANUARY.

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FEBRUARY 29 DAYS

THE MOON'S CHANGES.

☾ Last Quar., 3rd, 3.38 p.m. | ☽ First Qr., 18th, 3.46 a.m.
● New Moon, 10th, 11.17 a.m. | ○ Full Moon, 26th, 1.22 a.m.

BREEDER'S KALENDAR

SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Jan.	Nov.	June	June	April	
1	𝕾	Sexagesima. Shoot. ends; Salm. F. bgn.	7	13	25	1	2	32
2	M	*Candlemas Day*	8	14	26	2	3	33
3	Tu	*St. Blaise.* Wool Trade Festival	9	15	27	3	4	34
4	W	Sun rises 7h. 36m., sets 4h. 52m.	10	16	28	4	5	35
5	Th	*St. Agatha.* Tay Fishing opens	11	17	29	5	6	36
6	F	Pope Pius IX. died on 7th, 1878	12	18	30	6	7	37
7	S	Half Quarter-day on 8th	13	19	July 1	7	8	38
8	𝕾	Quinquagesima. *Shrove Sunday*	14	20	2	8	9	39
9	M	Sun's Declination, 15° 1′	15	21	3	9	10	40
10	Tu	*Shrove Tuesday.* Queen married, 1840	16	22	4	10	11	41
11	W	Ash Wednesday	17	23	5	11	12	42
12	Th	Spey Fishing opens	18	24	6	12	13	43
13	F	Average frosty nights in February, 11	19	25	7	13	14	44
14	S	*St. Valentine*	20	26	8	14	15	45
15	𝕾	Quadragesima. 1 SUNDAY in LENT	21	27	9	15	16	46
16	M	Great Snow Storms, 1827	22	28	10	16	17	47
17	Tu	Wild Fowl close time begins	23	29	11	17	18	48
18	W	Sun rises 7h. 14m., sets 5h. 15m.	24	30	12	18	19	49
19	Th	Princess Louise Victoria b. 20th, 1867	25	Dec. 1	13	19	20	50
20	F	*St. Mildred.* Malta Earthquake, 1868	26	2	14	20	21	51
21	S	Crocus flowers	27	3	15	21	22	52
22	𝕾	2 SUNDAY in LENT	28	4	16	22	23	53
23	M	Great Frost ended, 1827	29	5	17	23	24	54
24	Tu	*St. Matthias*	30	6	18	24	25	55
25	W	Length of Day 10h. 32m. [1818	31	7	19	25	26	56
26	Th	Spanish Political Refugees allowed home	Feb. 1	8	20	26	27	57
27	F	Corn Laws abolished, 1849	2	9	21	27	28	58
28	S	Hare Hunt. ends. Carlist War ended '76	3	10	22	28	29	59
29	𝕾	3 SUNDAY in LENT	4	11	23	29	30	60

February.

2—Burton-on-Tent, cattle
2—Doncaster, cattle, horses, stock
2—Reading, cattle, horses
7—Darlington, horses
9—Nantwich, cattle, sheep
9—Thirsk, cattle, sheep
10—Oakham, cattle, horses, sheep
11, 12—Stamford, cattle, h., sh.
12—Leek, cattle, pleasure
13—Ashbourne, cattle
13—Maidstone, cattle, horses, pl.
14—Loughborough, cattle
14—Wymondham, cattle, horses
17—Egremont, cattle, horses
18—Cockermouth, horses
23—Winchester, sheep
27—Newton Abbot, cattle, horses
28—Chester, cattle, h., sh., pigs

BRITISH INDIA.—The total area is about 1,558,254 square miles, and the population over 240 millions. Two-fifths consist of independent States, which acknowledge the supremacy of Great Britain, and are entirely under our control. The total extent and population of this gigantic possession may be fairly compared to the whole of Europe, exempting Russia.

Memoranda.

FEBRUARY.

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MARCH 31 Days

THE MOON'S CHANGES.

☾ Last Quar., 3rd, 11.6 p.m. | ☽ First Qr., 19th, 0.36 a.m.
● New Moon, 11th, 0.47 a.m. | ○ Full Moon, 26th, 1.23 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Feb.	Dec.	July	June	May	
1	M	*St. David.* Sun rises 6.48, sets 5.38 ...	5	12	24	30	1	61
2	Tu	*St. Chad.* Sun rises 6.43, sets 5.41......	6	13	25	July 1	2	62
3	W	San Stefano preliminary peace signd., 1878	7	14	26	2	3	63
4	Th	Mean rainfall of month 1.6 inch	8	15	27	3	4	64
5	F	Sun's Declination, 6° 37′	9	16	28	4	5	65
6	S	Temperature of evaporation, 39° 5′	10	17	29	5	6	66
7	S	4 SUNDAY in LENT. *St. Perpetua*	11	18	30	6	7	67
8	M	Rainy days in month, 10	12	19	31	7	8	68
9	Tu	Sultan ratified peace, 1878.................	13	20	Aug. 1.	8	9	69
10	W	Prince of Wales married, 1863	14	21	2	9	10	70
11	Th	Mean night temperature, 35° 73′	15	22	3	10	11	71
12	F	*St. Gregory*...................................	16	23	4	11	12	72
13	S	Common Elder leaves	17	24	5	12	13	73
14	S	5 SUNDAY in LENT............................	18	25	6	13	14	74
15	M	Laurel flowers, Lilac leaves.........[1878	19	26	7	14	15	75
16	Tu	Russia objects to Greece attend. Congrss.	20	27	8	15	16	76
17	W	*St. Patrick*, died 464........................	21	28	9	16	17	77
18	Th	Prince Louise born, 1848	22	29	10	17	18	78
19	F	Cambridge Lent term ends	23	30	11	18	19	79
20	S	*St. Cuthbert.* Oxford Lent term ends...	24	31	12	19	20	80
21	S	PALM SUNDAY. *St. Benedict*	25	Jan. 1	13	20	21	81
22	M	German Emperor born, 1797	26	2	14	21	22	82
23	Tu	Hilary Law Sittings end on 24th.........	27	3	15	22	23	83
24	W	Great gale, *Eurydice* foundered, 1878 ...	28	4	16	23	24	84
25	Th	*Annunciation. Lady Day*...................	29	5	17	24	25	85
26	F	GOOD FRIDAY. Duke of Cambrdge b. 1819	Mar. 1	6	18	25	26	86
27	S	Swallows appear .... [1854	2	7	19	26	27	87
28	S	EASTER SUNDAY. War dec. with Russia,	3	8	20	27	28	88
29	M	Bank and General Holiday	4	9	21	28	29	89
30	Tu	Heavy gales and snow storms	5	10	22	29	30	90
31	W	Peace of Paris, 1856. Oxford Term ends	6	11	23	30	31	91

March.

2—Leicester, cattle, horses, sh.
3—Bradford, cattle, horses, pl.
4—Darlington, cattle, horses
4—Bolton, cows
4—Stockport, cattle
5—Bury, cattle, horses
5, 6—Shrewsbury, horses
8—Blandford, cattle, horses, sh.
8—Nottingham, cattle
8—Uppingham, cattle, horses
15—Oakham, cattle, horses, sh.
15—Torrington, cattle
15—Woodbridge, cattle, h., sh.
16—Alston Moor, cattle, sheep
19—Abergavenny, stock
24—Hexham, cattle, h., st., sh.
24—Stamford, horses
25—Stockport, cattle
25—Uxbridge, cattle, horses, sh.
26—Chorley, cattle, horses, sheep
26—Nantwich, cattle, sheep
29—Chester, cattle, h., sh., pigs
29—Darlington, cattle, horses
29—Loughborough, cattle
29—Manchester, pleasure
31—Leek, cattle, pleasure

Memoranda.

MARCH.

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APRIL 30 Days

THE MOON'S CHANGES.

☾ Last Quar., 2nd, 6.13 a.m. | ☽ First Qr., 17th, 7.14 p.m.
● New Moon, 9th, 3.7 p.m. | ○ Full Moon, 24th, 10.50 p.m.

			BREEDER'S KALENDAR (SEE FOOT OF PAGE 2)					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Mar.	Jan.	Aug.	July	June	
1	Th	Pr. Bismarck born, 1815. *All Fools Day*	7	12	24	31	1	92
2	F	Cam. Easter Term begins. Cobden died,	8	13	25	Aug. 1	2	93
3	S	*St. Richard.* Cowslips flower......[1865	9	14	26	2	3	94
4	S	Low Sunday	10	15	27	3	4	95
5	M	British Museum instituted, 1753	11	16	28	4	5	96
6	Tu	*Old Lady Day.* Easter Law Sittings	12	17	29	5	6	97
7	W	Prince Leopold born, 1853.........[begin	13	18	30	6	7	98
8	Th	Loudon, botanist, born, 1783	14	19	31	7	8	99
9	F	Fire Insurance lapses if unpaid............	15	20	Sept. 1	8	9	100
10	S	Indian Mutiny, 1857	16	21	2	9	10	101
11	S	2nd Sunday after Easter..................	17	22	3	10	11	102
12	M	Arthur Yound died, 1820	18	23	4	11	12	103
13	Tu	Catholic emancipation, 1829...............	19	24	5	12	13	104
14	W	President Lincoln assassinated, 1865 ...	20	25	6	13	14	105
15	Th	Easter Law Term begins	21	26	7	14	15	106
16	F	Napoleon III. visited England, 1855 ...	22	27	8	15	16	107
17	S	Benjamin Franklin died, 1790	23	28	9	16	17	108
18	S	3rd Sunday after Easter	24	29	10	17	18	109
19	M	*Alphege.* Lord Byron died, 1824.........	25	30	11	18	19	110
20	Tu	*St. Agatha.* Severe Snow Storm, 1876	26	31	12	19	20	111
21	W	Number of rainy days in month, 11	27	Feb. 1	13	20	21	112
22	Th	Swallows usually appear....................	28	2	14	21	22	113
23	F	*St. George.* Birth of Shakespeare	29	3	15	22	23	114
24	S	Russia declares War against Turkey, 1877	30	4	16	23	24	115
25	S	*St. Mark.* 4th Sunday after Easter...	31	5	17	24	25	116
26	M	Bank of England founded, 1694	April 1	6	18	25	26	117
27	Tu	Ratification of Treaty of Paris, 1856 ...	2	7	19	26	27	118
28	W	Queen proclaimed Empress of India, '76	3	8	20	27	28	119
29	Th	Emperor of Russia born, 1818	4	9	21	28	29	120
30	F	Sun rises 4h. 36m., sets 7h. 18m.........	5	10	22	29	30	121

April.

1—Stamford, cattle, sheep
2—Pontypool, stock
5—Burton-on-Trent, c., cheese
5—Gloucester, cattle
5—Horncastle, cattle, sheep
5—Thirsk, cattle, sheep
7—Oakham, cattle, horses, sheep
8—Malton, cattle, sheep
9—Hull, cattle
9—Melton Mowbray, cattle
10—Norwich, cattle
13—Leicester, cattle, horses, sheep
15—Luton, cattle
16—Cockermouth, cattle
16—Stamford, cattle, sheep
16—Wellingborough, c., pleasure
17—Keswick, cattle, sheep
17—Wareham, cattl., h., sh., pigs
19—Chester, cattl., h., sheep, pigs
19—Horncastle, cattle, sheep
19—Nottingham, cattle, pleasure
19—Todmorden, cattle
20—Brampton, cattle, horses, shp.
20—Devizes, cattle, horses, sheep
21—Louth, cattle
22—Pontypool, steers
23—Barnet
23—Gainsborough, c., h., sh., pigs
23—Leek, cattle, pleasure
23—Selby, cattle, horses
23—Thame, cattle
24—Leigh, cattle
26—Loughborough, cattle
28—Stamford, horses
29—Altrincham, cattle, general
29—Darlington, cattle, horses
30—Cockermouth, cattle
30—Spalding, cattle, sheep

Memoranda.

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MAY 31 Days

THE MOON'S CHANGES.

☾ Last Quar., 1st, 1.53 p.m. | ☽ First Qr., 17th, 10.24 a.m.
● New Moon, 9th, 6.16 a.m. | ○ Full Moon, 24th, 6.39 a.m.
☾ Last Quar., 30th, 10.53 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			April	Feb.	Sept.	Aug.	July	
1	S	Duke of Connaught born, 1850	6	11	23	30	1	122
2	𝕾	5th SUNDAY AFTER EASTER	7	12	24	31	2	123
3	M	Royal Academy opens	8	13	25	Sept. 1	3	124
4	TU	Dr. Livingstone died, 1873	9	14	26	2	4	125
5	W	Napoleon I. died, 1821........................	10	15	27	3	5	126
6	TH	*St. John.* Ascension Day. Holy Thurs.	11	16	28	4	6	127
7	F	Lord Brougham died, 1868	12	17	29	5	7	128
8	S	Clock slow 3m. 41s.	13	18	30	6	8	129
9	𝕾	SUNDAY AFTER ASCENSION DAY.........	14	19	Oct. 1	7	9	120
10	M	Sun rises 4h. 18m., sets 7m. 34s.	15	20	2	8	10	131
11	TU	Moon South 1h. 41m. afternoon	16	21	3	9	11	132
12	W	Moon South 2.31 P.M. ....[Day	17	22	4	10	12	133
13	TH	Lowest night temp. 44° 94′. Old May	18	23	5	11	13	134
14	F	Fahrenheit born, 1686. Law Sittings end	19	24	6	12	14	135
15	S	Corn Laws passed House of Com. 1846	20	25	7	13	15	136
16	𝕾	Whit Sunday	21	26	8	14	16	137
17	M	Bank and General Holiday	22	27	9	15	17	138
18	TU	Royal Literary Fund instituted, 1790 ...	23	28	10	16	18	139
19	W	Ardahan captured by Russians, 1877 ...	24	29	11	17	19	140
20	TH	Sun rises 4h. 3m., sets 7h. 49m.	25	Mar. 1	12	18	20	141
21	F	Roumania declares Independence, 1877	26	2	13	19	21	142
22	S	Length of day, 15h. 52m.	27	3	14	20	22	143
23	𝕾	Trinity Sunday	28	4	15	21	23	144
24	M	Birth of Queen Victoria, 1819	29	5	16	22	24	145
25	TU	Trinity Law Sittings begin	30	6	17	23	25	146
26	W	*St. Augustine.* Belleville captured, 1871	May 1	7	18	24	26	147
27	TH	Sun rises 3h. 55m., sets 7h. 59m.........	2	8	19	25	27	148
28	F	Earl Russell died, 1878.....................	3	9	20	26	28	149
29	S	Restoration of King Charles II.	4	10	21	27	29	150
30	𝕾	1st SUNDAY AFTER TRINITY...............	5	11	22	28	30	151
31	M	Wykeham Martin, M.P., died in H. of C.	6	12	23	29	31	152

May.

1—Poole
1—Reading, cattle, horses, pleasure
1—Stockport, cattle, pleasure
3—Bury, cattle, horses
3—Coventry, cattle, horses
3—Westhoughton, cattle, h., sheep
4—Brecon, cttl, horses, cheese, pl.
4—Torrington, cattle
4, 5—Boston
4, 5—Guildford, cattle, horses, shp.
5—Chorley, cattle, horses, sheep
6—Lewes, cattle
6—Oakham, cattle, horses, sheep
6—Scarborough, cattle
7—Cheddar, cattle, h., shp., pigs
8—Braintree, cattle, h., sh., hops
8—Keighley, horses, sheep
8—Wisbeach, cattle, horses
10—Farnham, cattle, pleasure
10—Stamford, cattle, horses, shp.
11—Stroud, stock, pigs
12—Congleton, cattle, horses
12—Leicester, cattle, horses, shp.
12—Lymington, c., h., sh., pgs, pl.
13—Andover, cattle, horses, cheese
13, 14—Ripon, cattle, general
14—Abergavenny, stock, pleasure
14—Rochdale, cattle
14—Swaffham, cattle
15—Egremont, cattle
17—Cockermouth, cattle
17—Holbeach, horses
17—Manchester, cattle, horses
17—St. Ives, cattle, horses, sheep
17—Wymondham, cattle, horses
18—Leek, cattle
20—Swindon, stock, pigs
22—Loughborough, cattle, pleasure
26—Thirsk, cattle, sheep
29—Alston Moor, cattle, sheep
29—Dorking, cattle, hs., sh., pigs

Memoranda.

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JUNE 30 Days

THE MOON'S CHANGES.

● New Moon, 7th, 9.55 p.m. | ○ Full Moon, 22nd, 1.46 p.m.
☽ First Quar., 15th, 9.52 p.m. | ☾ Last Qr., 29th, 9.57 a.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			May	Mar.	Oct.	Sept.	Aug.	
1	Tu	*Pentecost.* Prince Napoleon killed, 1879	7	13	24	30	1	153
2	W	Length of Day, 16h. 16m..................	8	14	25	Oct. 1	2	154
3	Th	Sun rises 3h. 49m., sets 8h. 6m.	9	15	26	2	3	155
4	F	Hurricane in Belgium, 1872..............	10	16	27	3	4	156
5	S	*St. Boniface.* Adam Smith born, 1723..	11	17	28	4	5	157
6	𝕾	2nd Sunday after Trinity	12	18	29	5	6	158
7	M	Clock after sun 1m. 20s..................	13	19	30	6	7	159
8	Tu	Beaconsfield left London for Congress,	14	20	31	7	8	160
9	W	Charles Dickens died, 1870.........[1878	15	21	Nov. 1	8	9	161
10	Th	Abolition of Slave Trade, 1806...........	16	22	2	9	10	162
11	F	*St. Barnabas*	17	23	3	10	11	163
12	S	Corpus Christi. Money panic, 1866	18	24	4	11	12	164
13	𝕾	3rd Sunday after Trinity...................	19	25	5	12	13	165
14	M	Battle of Marengo, 1800	20	26	6	13	14	166
15	Tu	Berlin Congress first meeting, 1878	21	27	7	14	15	167
16	W	Rainy days in month, 11	22	28	8	15	16	168
17	Th	*St. Alban.* Second meeting, Berlin Con-	23	29	9	16	17	169
18	F	Battle of Waterloo, 1815 ... [gress, 1878	24	30	10	17	18	170
19	S	Temperature evaporation, 54° 8′	25	31	11	18	19	171
20	𝕾	4th Sunday after Trinity	26	April 1	12	19	20	172
21	M	Sun enters Cancer. Longest day	27	2	13	20	21	173
22	Tu	Balkans accepted as limit to Bulgaria,	28	3	14	21	22	174
23	W	Longest night temp. 50° 61′ ...... [1878	29	4	15	22	23	175
24	Th	*St. John Baptist. Midsummer Day* ...	30	5	16	23	24	176
25	F	Cambridge Easter Term ends	31	6	17	24	25	177
26	S	G. White of Selborne died, 1793	June 1	7	18	25	26	178
27	𝕾	5th Sunday after Trinity	2	8	19	26	27	179
28	M	Coronation Day. Lime tree fl.	3	9	20	27	28	180
29	Tu	Khedive deposed, June 26, 1879.........	4	10	21	28	29	181
30	W	Royal Ag. Kilburn show opened, 1879...	5	11	22	29	30	182

June.

2—Cockermouth, cattle
2—Darlington, cattle, horses
3—Alford, sheep
3—Melton Mowbray, cattle
3—Reigate, cattle
4—Wellingborough
5—Ripon, cattle, horses
7—Tiverton, cattle, hs., sh., st.
10—Darlington, cattle, horses
10—Oakham, cattle, horses, sheep
11—Nantwich, horses
11—Newmarket, cattle, horses, st.
11—Sheffield, cattle, horses, sheep
12—Bedworth, cattle, pleasure
12—Leek, cattle
14—Birmingham, cattle, h., sh.
15—Malton, cattle, sheep
17, 19—Bradford, cattle, h., pl.
19—Northampton, cattle, horses
20—Hemel Hempstead, c., sh., st.
20.—Maidstone, cattle, horses, pl.
21, 22—Horncastle, cattle, sheep
23, 24—Stamford, cattle, horses
24—Farnham, cattle, pleasure
24—Selby, cattle, horses
24—Staleybridge, cattle
24, 26—Cambridge, cattle, h., pl.
25—Cockermouth, cattle
26—Newton Abbot, cattle, horses
28—Spalding, cattle, sheep

Memoranda.

JUNE.

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JULY 31 Days

THE MOON'S CHANGES.

● New Moon, 7th, 1.21 p.m. | ○ Full Moon, 21st, 9.2 p.m.
☽ First Qr., 15th, 6.16 a.m. | ☾ Last Qr., 28th, 11.41 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			June	April	Nov.	Oct.	Aug.	
1	Th	Mean temperature, 62° 47′	6	12	23	30	31	183
2	F	*Visit. B. Virgin.* Sun in Apogee	7	13	24	31	Sept. 1	184
3	S	Bat. of Sadowa, '66. Dog days com.	8	14	25	Nov. 1	2	185
4	𝔖	6th SUNDAY after TRINITY	9	15	26	2	3	186
5	M	Sun rises 3h. 52m., sets 8h. 17m.	10	16	27	3	4	187
6	Tu	Princess of Wales born, 1868	11	17	28	4	5	188
7	W	The Oxford Act	12	18	29	5	6	189
8	Th	Mean rainfall, 2.7 inches for month	13	19	30	6	7	190
9	F	Fire Insurances lapse, if unpaid	14	20	Dec. 1	7	8	191
10	S	Oxford Trinity Term ends	15	21	2	8	9	192
11	𝔖	7th SUNDAY after TRINITY [1877	16	22	3	9	10	193
12	M	Russians gained summits of Balkans,	17	23	4	10	11	194
13	Tu	Cheese Duty abolished, 1860	18	24	5	11	12	195
14	W	Clock before Sun 5m. 33s.	19	25	6	12	13	196
15	Th	*St. Swithun.* Weather period	20	26	7	13	14	197
16	F	Nicopolis surrendered, 1877	21	27	8	14	15	198
17	S	Franco-Prussian War began, 1870	22	28	9	15	16	199
18	𝔖	8th SUNDAY after TRINITY	23	29	10	16	17	200
19	M	Russians occupy Tchernavado, 1877	24	30	11	17	18	201
20	Tu	Osman Pacha def. Russians at Plevna, '77	25	May 1	12	18	19	202
21	W	Buckwheat flowers. Robt. Burns d., 1796	26	2	13	19	20	203
22	Th	*St. Magdalene*	27	3	14	20	21	204
23	F	Defeat of Turks on Lom, 1877	28	4	15	21	22	205
24	S	Window Tax repealed, 1851	29	5	16	22	23	206
25	𝔖	9th SUNDAY after TRINITY. *St. James*	30	6	17	23	24	207
26	M	Atlantic Cable laid, 1866	July 1	7	18	24	25	208
27	Tu	Swifts begin to depart, last seen 31st	2	8	19	25	26	209
28	W	Rainy days in month, 12	3	9	20	26	27	210
29	Th	*Eurydice* raised, 1878	4	10	21	27	28	211
30	F	Two days' attack on Plevna repulsed, 1877	5	11	22	28	29	212
31	S	Defeat of Russians at Eski Saghra	6	12	23	29	30	213

July.
3—Leek, cattle
3—Chester, cattle, h., sh., pigs
5—Gloucester, cattle
5—Leicester, cattle, horses, sheep
5—Torrington, cattle
6—Bedford, cattle, pigs
6—Bodmin, cattle, sheep
6—Uppingham, cattle, horses
8—Oakham, cattle, horses, sheep
10—Peterborough, cattle, horses
10—Leeds, horses, pleasure
12—Burnley, cattle, horses
12—Scarborough, cattle
13—Congleton, cattle, fruit
16—Abergavenny, stock
17—Swaffham, lambs
19—Scarborough, cattle
19—Sherborne, cattle, horses, sh.
19—Warrington, cattle
20—Cambridge, sheep, lambs
20—Maidstone, cattle, horses, pl.
23, 24—Honiton, cattle, h. sh.
26—Liverpool, horses, stock
26—Reading, cattle. h., cherry
26—Sherborne, cattle, horses, sh.
26—Wisbeach, horses
27—Melksham, cattle, horses, sh.
28—Leek, cattle
30, 31—Bolton, cows, horses
31—Alford, lambs
31—Alfreton, horses, cows, sheep
31—Uxbridge, cattle, horses, sh.

ROYAL AGRICULTURAL SOCIETY'S SHOW, CARLISLE.

Memoranda.

JUNE.

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JULY 31 Days

THE MOON'S CHANGES.

● New Moon, 7th, 1.21 p.m. | ○ Full Moon, 21st, 9.2 p.m.
☽ First Qr., 15th, 6.16 a.m. | ☾ Last Qr., 28th, 11.41 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			June	April	Nov.	Oct.	Aug.	
1	Th	Mean temperature, 62° 47′	6	12	23	30	31	183
2	F	*Visit. B. Virgin.* Sun in Apogee.........	7	13	24	31	Sept. 1	184
3	S	Bat. of Sadowa, '66. Dog days com. ...	8	14	25	Nov. 1	2	185
4	S	6th Sunday after Trinity	9	15	26	2	3	186
5	M	Sun rises 3h. 52m., sets 8h. 17m..........	10	16	27	3	4	187
6	Tu	Princess of Wales born, 1868	11	17	28	4	5	188
7	W	The Oxford Act..............................	12	18	29	5	6	189
8	Th	Mean rainfall, 2.7 inches for month......	13	19	30	6	7	190
9	F	Fire Insurances lapse, if unpaid	14	20	Dec. 1	7	8	191
10	S	Oxford Trinity Term ends....................	15	21	2	8	9	192
11	S	7th Sunday after Trinity ....[1877	16	22	3	9	10	193
12	M	Russians gained summits of Balkans,	17	23	4	10	11	194
13	Tu	Cheese Duty abolished, 1860	18	24	5	11	12	195
14	W	Clock before Sun 5m. 33s.	19	25	6	12	13	196
15	Th	*St. Swithun.* Weather period	20	26	7	13	14	197
16	F	Nicopolis surrendered, 1877................	21	27	8	14	15	198
17	S	Franco-Prussian War began, 1870	22	28	9	15	16	199
18	S	8th Sunday after Trinity	23	29	10	16	17	200
19	M	Russians occupy Tchernavado, 1877 ...	24	30	11	17	18	201
20	Tu	Osman Pacha def. Russians at Plevna, '77	25	May 1	12	18	19	202
21	W	Buckwheat flowers. Robt. Burns d., 1796	26	2	13	19	20	203
22	Th	*St. Magdalene*................................	27	3	14	20	21	204
23	F	Defeat of Turks on Lom, 1877............	28	4	15	21	22	205
24	S	Window Tax repealed, 1851...............	29	5	16	22	23	206
25	S	9th Sunday after Trinity. *St. James* ...	30	6	17	23	24	207
26	M	Atlantic Cable laid, 1866	July 1	7	18	24	25	208
27	Tu	Swifts begin to depart, last seen 31st ...	2	8	19	25	26	209
28	W	Rainy days in month, 12	3	9	20	26	27	210
29	Th	*Eurydice* raised, 1878..........................	4	10	21	27	28	211
30	F	Two days' attack on Plevna repulsed, 1877	5	11	22	28	29	212
31	S	Defeat of Russians at Eski Saghra	6	12	23	29	30	213

July.

3—Leek, cattle
3—Chester, cattle, h., sh., pigs
5—Gloucester, cattle
5—Leicester, cattle, horses, sheep
5—Torrington, cattle
6—Bedford, cattle, pigs
6—Bodmin, cattle, sheep
6—Uppingham, cattle, horses
8—Oakham, cattle, horses, sheep
10—Peterborough, cattle, horses
10—Leeds, horses, pleasure
12—Burnley, cattle, horses
12—Scarborough, cattle
13—Congleton, cattle, fruit
16—Abergavenny, stock
17—Swaffham, lambs
19—Scarborough, cattle
19—Sherborne, cattle, horses, sh.
19—Warrington, cattle
20—Cambridge, sheep, lambs
20—Maidstone, cattle, horses, pl.
23, 24—Honiton, cattle, h. sh.
26—Liverpool, horses, stock
26—Reading, cattle. h., cherry
26—Sherborne, cattle, horses, sh.
26—Wisbeach, horses
27—Melksham, cattle, horses, sh.
28—Leek, cattle
30, 31—Bolton, cows, horses
31—Alford, lambs
31—Alfreton, horses, cows, sheep
31—Uxbridge, cattle, horses, sh.

ROYAL AGRICULTURAL SOCIETY'S SHOW, CARLISLE.

Memoranda.

JULY.

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JULY 31 Days

THE MOON'S CHANGES.

● New Moon, 7th, 1.21 p.m. | ○ Full Moon, 21st, 9.2 p.m.
☽ First Qr., 15th, 6.16 a.m. | ☾ Last Qr., 28th, 11.41 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			June	April	Nov.	Oct.	Aug.	
1	Th	Mean temperature, 62° 47′	6	12	23	30	31	183
2	F	*Visit. B. Virgin.* Sun in Apogee	7	13	24	31	Sept. 1	184
3	S	Bat. of Sadowa, '66. Dog days com. ...	8	14	25	Nov. 1	2	185
4	𝕾	6th Sunday after Trinity	9	15	26	2	3	186
5	M	Sun rises 3h. 52m., sets 8h. 17m.	10	16	27	3	4	187
6	Tu	Princess of Wales born, 1868	11	17	28	4	5	188
7	W	The Oxford Act	12	18	29	5	6	189
8	Th	Mean rainfall, 2.7 inches for month	13	19	30	6	7	190
9	F	Fire Insurances lapse, if unpaid	14	20	Dec. 1	7	8	191
10	S	Oxford Trinity Term ends	15	21	2	8	9	192
11	𝕾	7th Sunday after Trinity [1877	16	22	3	9	10	193
12	M	Russians gained summits of Balkans,	17	23	4	10	11	194
13	Tu	Cheese Duty abolished, 1860	18	24	5	11	12	195
14	W	Clock before Sun 5m. 33s.	19	25	6	12	13	196
15	Th	*St. Swithun.* Weather period	20	26	7	13	14	197
16	F	Nicopolis surrendered, 1877	21	27	8	14	15	198
17	S	Franco-Prussian War began, 1870	22	28	9	15	16	199
18	𝕾	8th Sunday after Trinity	23	29	10	16	17	200
19	M	Russians occupy Tchernavado, 1877 ...	24	30	11	17	18	201
20	Tu	Osman Pacha def. Russians at Plevna, '77	25	May 1	12	18	19	202
21	W	Buckwheat flowers. Robt. Burns d., 1796	26	2	13	19	20	203
22	Th	*St. Magdalene*	27	3	14	20	21	204
23	F	Defeat of Turks on Lom, 1877	28	4	15	21	22	205
24	S	Window Tax repealed, 1851	29	5	16	22	23	206
25	𝕾	9th Sunday after Trinity. *St. James* ...	30	6	17	23	24	207
26	M	Atlantic Cable laid, 1866	July 1	7	18	24	25	208
27	Tu	Swifts begin to depart, last seen 31st ...	2	8	19	25	26	209
28	W	Rainy days in month, 12	3	9	20	26	27	210
29	Th	*Eurydice* raised, 1878	4	10	21	27	28	211
30	F	Two days' attack on Plevna repulsed, 1877	5	11	22	28	29	212
31	S	Defeat of Russians at Eski Saghra	6	12	23	29	30	213

July.
3—Leek, cattle
3—Chester, cattle, h., sh., pigs
5—Gloucester, cattle
5—Leicester, cattle, horses, sheep
5—Torrington, cattle
6—Bedford, cattle, pigs
6—Bodmin, cattle, sheep
6—Uppingham, cattle, horses
8—Oakham, cattle, horses, sheep
10—Peterborough, cattle, horses
10—Leeds, horses, pleasure
12—Burnley, cattle, horses
12—Scarborough, cattle
13—Congleton, cattle, fruit
16—Abergavenny, stock
17—Swaffham, lambs
19—Scarborough, cattle
19—Sherborne, cattle, horses, sh.
19—Warrington, cattle
20—Cambridge, sheep, lambs
20—Maidstone, cattle, horses, pl.
23, 24—Honiton, cattle, h. sh.
26—Liverpool, horses, stock
26—Reading, cattle. h., cherry
26—Sherborne, cattle, horses, sh.
26—Wisbeach, horses
27—Melksham, cattle, horses, sh.
28—Leek, cattle
30, 31—Bolton, cows, horses
31—Alford, lambs
31—Alfreton, horses, cows, sheep
31—Uxbridge, cattle, horses, sh.

ROYAL AGRICULTURAL SOCIETY'S SHOW, CARLISLE.

Memoranda.

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AUGUST 31 Days

THE MOON'S CHANGES.

● New Moon, 6th, 3.48 a.m. | ○ Full Moon, 20th, 5.18 a.m.
☽ First Qr., 13th, 0.42 p.m. | ☾ Last Qr., 27th, 4.15 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			July	May	Dec.	Nov.	Oct.	
1	𝕾	10th Sun. after Trinity. *Lammas Day*	7	13	24	30	1	214
2	M	Bank and General Holiday	8	14	25	Dec. 1	2	215
3	Tu	Congress Banquet at Mansion Ho., 1878	9	15	26	2	3	216
4	W	Wheat cutting began in Kent, 1877	10	16	27	3	4	217
5	Th	Cabul captured, 1840	11	17	28	4	5	218
6	F	Duke of Edinburgh born, 1844	12	18	29	5	6	219
7	S	*Name of Jesus.* Trinity Law Sittings end	13	19	30	6	7	220
8	𝕾	11th Sunday after Trinity	14	20	31	7	8	221
9	M	Sun after Clock 5m. 20s. [1675	15	21	Jan. 1	8	9	222
10	Tu	*St. Lawrence.* Grnwich. Observ. founded,	16	22	2	9	10	223
11	W	Half Quarter. Dog days end	17	23	3	10	11	224
12	Th	Grouse and Ptarmigan Shooting begins	18	24	4	11	12	225
13	F	*Old Lammas Day.* Temp. 1876, 96° shade	19	25	5	12	13	226
14	S	First book printed, 1457	20	26	6	13	14	227
15	𝕾	12th Sunday after Trinity	21	27	7	14	15	228
16	M	Battle of Gravelotte, 1870	22	28	8	15	16	229
17	Tu	Frederick the Great died, 1786	23	29	9	16	17	230
18	W	Heavy Rains and Floods, 1879	24	30	10	17	18	231
19	Th	Strasbourg Bombardment com. 1870	25	31	11	18	19	232
20	F	Blackcock Shooting begins	26	June 1	12	19	20	233
21	S	Turks repulsed in Schipka Pass, 1877	27	2	13	20	21	234
22	𝕾	13th Sunday after Trinity	28	3	14	21	22	235
23	M	Rainy days in month, 11	29	4	15	22	23	236
24	Tu	*St. Bartholomew*	30	5	16	23	24	237
25	W	Prussians repulsed at Verdun, 1870	31	6	17	24	25	238
26	Th	Temperature evaporation, 56° 6′	Aug. 1	7	18	25	26	239
27	F	Floods in Thames Valley, 1879	2	8	19	26	27	240
28	S	*St. Augustine.* Foreigners left Paris, 1870	3	9	20	27	28	241
29	𝕾	14th Sunday after Trinity	4	10	21	28	29	242
30	M	Esk Net Fishing closes	5	11	22	29	30	243
31	Tu	John Bunyan, and Bailey, astronomer, d.	6	12	23	30	31	244

August.

2—Northwich, cattle, general
2—Winchester, sheep
3, 5—Thirsk, cattle, sheep
4—Edgware, cattle
4, 5—Stamford, cattle, horses
5—Doncaster, cattle, horses, st.
5—Lindfield, cattle, horses, sh.
5—Northampton, sheep
5, 6—Altrincham, cattle, general
6—Hexham, cattle, h., sh., st.
7—Chester, cattle, h., sh., pigs
11—Oakham, cattle, horses, sh.
12—Horncastle, horses
12—Loughborough, cattle
12—Wisbeach, cattle
20—Chorley, cattle, horses, sheep
21—Melton Mowbray, cattle
21—Stroud, pigs, stock
23—Skipton, horses
24—Alford, sheep
26—Carlisle, cattle, general
26—Hinckley, cattle, horses, sh.
26—Northampton, sheep
26—Romsey, cattle, h., sh., pigs
27—Ashford lambs
28—Spalding, cattle, horses, sh.

Memoranda.

AUGUST.

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SEPTEMBER 30 Days

THE MOON'S CHANGES.

● New Moon, 4th, 4.52 p.m. | ○ Full Moon, 18th, 3.29 p.m.
☽ First Qr., 11th, 6.25 p.m. | ☾ Last Qr., 26th, 11.9 a.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year
			Mare	Cow	Ewe	Sow	Bitch	
			Aug.	June	Jan.	Dec.	Nov.	
1	W	Partridge Shooting begins. *St. Giles* ...	7	13	24	31	1	245
2	TH	Battle of Sedan, 1870	8	14	25	Jan. 1	2	246
3	F	Death of M. Thiers, 1877	9	15	26	2	3	247
4	S	Fall of French Empire, 1870	10	16	27	3	4	248
5	𝕾	15th SUNDAY after TRINITY	11	17	28	4	5	249
6	M	Sun rises 5h. 22m., sets 6h. 54m..........	12	18	29	5	6	250
7	TU	H.M.S. *Captain* capsized, 1870	13	19	30	6	7	251
8	W	*Birth of the Blessed Virgin Mary*.........	14	20	31	7	8	252
9	TH	Sebastopol taken, 1855....................	15	21	Feb. 1	8	9	253
10	F	Cyprus Agricultural Journal started, '78	16	22	2	9	10	254
11	S	The Comet of 1858 appeared	17	23	3	10	11	255
12	𝕾	16th SUNDAY after TRINITY	18	24	4	11	12	256
13	M	Salmon Fishing in Scotland ends.........	19	25	5	12	13	257
14	TU	Duke of Wellington died, 1852	20	26	6	13	14	258
15	W	Buck Hunting begins	21	27	7	14	15	259
16	TH	Toul Bombarded and Fired, 1870	22	28	8	15	16	260
17	F	Mont Cenis Tunnel opened, 1871	23	29	9	16	17	261
18	S	First Day of Jewish Year, 5641	24	30	10	17	18	262
19	𝕾	17th SUNDAY after TRINITY	25	July 1	11	18	19	263
20	M	Siege of Paris began, 1870	26	2	12	19	20	264
21	TU	*St. Matt.* Cleopatra's Needle left Egypt,	27	3	13	20	21	265
22	W	Autumnal Equinox ....[1877	28	4	14	21	22	266
23	TH	Mean rainfall of month, 2.5 inches	29	5	15	22	23	267
24	F	Death of M. Le Verrier, 1877	30	6	16	23	24	268
25	S	Troops ord. to Afghan Frontier, 1878...	31	7	17	24	25	269
26	𝕾	18th SUNDAY after TRINITY	Sept. 1	8	18	25	26	270
27	M	Rainy days in month, 12	2	9	19	26	27	271
28	TU	Strasburgh captured, 1870.................	3	10	20	27	28	272
29	W	*Michaelmas.* Lord Mayor elected	4	11	21	28	29	273
30	TH	*St. Jerome.* Sun before clock 9m. 56s.	5	12	22	29	30	274

September.
4—Crewkerne, cattle, h., sh.
4, 6—Barnet, horses
6—Chester, cattle, h., sh., pigs
7—Peterborough, rams
8—Oakham, cattle, horses, sh.
9—Blandford, cattle, horses, sh.
9—Eversham, cheese, rams
11—Horncastle, sheep, lms., foals
11—Wareham, cattle, h., sh., pigs
17—Alford, cattle, horses, sheep
17—Congleton, cattle, horses
17—Holbeach, horses
17—Newton Abbot, cattle, horses
18—Bury, cattle, horses
18—Egremont, cattle
20—Carlisle, cattle
20—Glastonbury, cattle, h., sh.
20—Northampton, sheep
21—Lewes, cattle, horses, sheep
21—Reading, cattle, horses, cheese
25—Abergavenny, cheese, stock
25—Alston Moor, cattle, sheep
25—Spalding, cattle, horses, sheep
27—Birmingham, cattle, h., sh.
28—Gloucester, cattle
28—Lewes, cattle, horses, sheep
29—Melton Mowbray, cattle
29—Uxbridge, cattle
30—Burton-on-Trent, cattle, h.

Memoranda.

SEPTEMBER.

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OCTOBER 31 Days

THE MOON'S CHANGES.

● New Moon, 4th, 4.33 a.m. | ○ Full Moon, 18th, 4.26 a.m.
☽ First Quar., 11th, 0.35 a.m. | ☾ Last Quar., 26th, 7.0 a.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Sept.	July	Feb.	Jan.	Dec.	
1	F	*St. Remigius.* Cam. Mich. term begins..	6	13	23	30	1	275
2	S	Nottingham Goose Fair....................	7	14	24	31	2	276
3	𝕾	19th SUNDAY after TRINITY	8	15	25	Feb. 1	3	277
4	M	Haws, Hips, and Sloes ripen..............	9	16	26	2	4	278
5	Tu	Earthquake felt in England, 1863.........	10	17	27	3	5	279
6	W	*St. Faith.* Dividends payable	11	18	28	4	6	280
7	Th	Sun rises 6h. 13m., sets 5h. 23m..........	12	19	29	5	7	281
8	F	Chicago burned down, 1871................	13	20	Mar. 1	6	8	282
9	S	Sun before clock 12m. 39s.	14	21	2	7	9	283
10	𝕾	20th SUNDAY after TRINITY	15	22	3	8	10	284
11	M	Old Mich. Day. Oxford term begins ...	16	23	4	9	11	285
12	Tu	Gossamer abounds..........................	17	24	5	10	12	286
13	W	Fieldfares arrive. Poplars shed leaves..	18	25	6	11	13	287
14	Th	Fire Insurance lapses if unpaid............	19	26	7	12	14	288
15	F	*St. Teresa.* Forth and Spey rod fish. ends	20	27	8	13	15	289
16	S	Day 10h. 36m. long.........................	21	28	9	14	16	290
17	𝕾	21st SUNDAY after TRINITY	22	29	10	15	17	291
18	M	*St. Luke.* Stock Exchange panic, 1876.	23	30	11	16	18	292
19	Tu	Glasgow Bank Directors arrested, 1878 ..	24	31	12	17	19	293
20	W	Italian troops enter Rome, 1870..........	25	Aug. 1	13	18	20	294
21	Th	Battle of Trafalgar, 1805..................	26	2	14	19	21	295
22	F	Blantyre explosion, 200 killed, 1877......	27	3	15	20	22	296
23	S	Planet Neptune discovered, 1806.........	28	4	16	21	23	297
24	𝕾	22nd SUNDAY after TRINITY	29	5	17	22	24	298
25	M	Battle of Balaclava, 1854..................	30	6	18	23	25	299
26	Tu	Capitulation of Metz, 1870	Oct. 1	7	19	24	26	300
27	W	Sir Stafford Northcote b., 1818	2	8	20	25	27	301
28	Th	*Sts. Simon and Jude.* Ash sheds leaves	3	9	21	26	38	302
29	F	Hare hunting begins	4	10	22	27	29	303
30	S	King Alfred died, 901. Elm leaves fall..	5	11	23	28	30	304
31	𝕾	23rd SUNDAY after TRINITY. *Hallowe'en*	6	12	24	29	31	305

October.
1.—Manchester, cattle, horses
1, 2—Peterborough, cattle, pl.
1, 6—Nottingham, cattle, ch., pl.
2—Braintree, c., h., sh., hops
2—Liskeard, cattle, honey, pl.
2—Lymington, c., h., sh., pigs, pl.
2—Ripon, sheep
2—Tiverton, c., h., sh., pigs
4—Daventry, cattle
8—Selby, cattle, horses
8—Leicester, cattle, horses, sheep
11—Chester, c., h., sh., pigs
11—Glastonbury, cattle, sheep
11—Holbeach, stock, pleasure
11—Hull, cattle
11—Keswick, cattle, sheep
11—Pontypool, sheep
11—Scarborough, cattle
11—St. Ives, cattle, horses, sheep
11—Thame, cattle
11—Torrington, cattle
11—Uxbridge, cattle
11, 12—Malton, cattle, sheep
12—Bedford, cattle, pigs
12—Westhoughton, c., h., sheep
14—Sherborne, cattle, horses, sheep
14, 15—Bolton, cows, horses
16—Alston Moor, cattle, sheep
19—Leek, cattle, pleasure
18—Brampton, cattle, sheep
18—Oakham, cattle, horses, sheep
18, 19—Ashbourne, sheep
10—Chichester, horses, pleasure
20—Devizes, cattle, horses, sheep
20, 29—Gainsbro' c., h., sh., pl.
21—Ashbourne, horses
21—Chorley, cattle, horses, sheep
21—Luton, cattle
23—Stockport, cattle, horses, sh.
23—Winchester, sheep
23, 25—Ely, cattle, horses

Memoranda.

OCTOBER.

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NOVEMBER 30 Days

THE MOON'S CHANGES.

● New Moon, 2nd, 3.55 p.m. | ○ Full Moon, 16th, 8.39 p.m.
☽ First Quar., 9th, 8.20 a.m. | ☾ Last Quar., 25th, 2.5 p.m.

BREEDER'S KALENDAR
SEE FOOT OF PAGE 2

			Mare	Cow	Ewe	Sow	Bitch	Day of Year
			Oct.	Aug.	Mar.	Mar.	an.	
1	M	*All Saints.* Stock Exchange Holiday	7	13	25	1	1	306
2	Tu	*All Souls.* Mich. Law Sittngs commence	8	14	26	2	2	307
3	W	Sun before Clock 16m. 20s........	9	15	27	3	3	308
4	Th	Sun rises 7h. 1m., sets 4h. 26m.	10	16	28	4	4	309
5	F	Gnpwdr. Plt, 1605. B. of Inkrmn., 1854	11	17	29	5	5	310
6	S	*St. Leonard.* Chateaudun retkn. by Frnch,	12	18	30	6	6	311
7	𝕾	24th SUNDAY after TRINITY.........[1870	13	19	31	7	7	312
8	M		14	20	April 1	8	8	313
9	Tu	Prince of Wales born, 1841	15	21	2	9	9	314
10	W	Municipal elections. Luther born, 1483	16	22	3	10	10	315
11	Th	*St. Martin,* Half-Quarter Day	17	23	4	11	11	316
12	F	Destructive Gale, 1877	18	24	5	12	12	317
13	S	Meteoric period	19	25	6	13	13	318
14	𝕾	25th SUN. after TRIN. Sun sets 4h. 11 m.	20	26	7	14	14	319
15	M	Rainy days in month, 12	21	27	8	15	15	320
16	Tu	Great Storms, 1866	22	28	9	16	16	321
17	W	*St. Hugh of Lincoln*	23	29	10	17	17	322
18	Th	Fall of Kars, 1877	24	30	11	18	18	323
19	F	Great Floods at Norwich, 1878	25	31	12	19	19	324
20	S	*St. Edmund.* Suez Canal opnd in 1869	26	Sept. 1	13	20	20	325
21	𝕾	26th SUN. af. TRIN. *Prsntion. B. V. Mary*	27	2	14	21	21	326
22	M	*St. Cecilia.* Sun enters Sagittarius	28	3	15	22	22	327
23	Tu	*St. Clement.* Old Martinmas Day	29	4	16	23	23	328
24	W	Destructive Gale, 1877	30	5	17	24	24	329
25	Th	*St. Katharine.* Apple leaves fall........	31	6	18	25	25	330
26	F	Princess Dagmar born, 1846........	Nov 1	7	19	26	26	331
27	S	Finches congrgat. Cartagena bmbd., 1873	2	8	20	27	27	332
28	𝕾	1st SUNDAY in ADVENT	3	9	21	28	28	333
29	M	Great Sortie from Paris, 1870	4	10	22	29	29	334
30	Tu	*St. Andrew.* Tweed Rod Fishing ends...	5	11	23	30	30	335

November.

1—Coventry, cattle, horses
2—Brecon, cattle, h., cheese, pl.
2—Poole
3—Stamford, horses
4—Alston Moor, cattle, h., sh.
5—Portland, horses, pigs, stock
5—Staleybridge, cattle, sheep
6—Northampton, sheep
6—Oakham, cattle, horses, sheep
6—Ripon, sheep
6—Swaffham, cattle, pleasure
8—Alford, cattle, sheep, pleasure
8—Blandford, cattle, horse, sh.
8—Keighley, horse, stock
8—Newmarket, cattle, horse, st.
8—Rochdale, cattle
8—Romsey, cattle, h., sh., pigs
8, 9—Leeds, horse, pleasure
8, 9—Stamford, cattle, horse, sh.
9—Carlisle, cattle
9—Hexham, cattle, h., sh., st.
10—Farnham, cattle, pleasure
11—Liverpool, horse, stock
12—Cambridge, sheep, lambs
12—Newton Abbot, cattle, horse
12—Penrith, cattle
13—Loughborough, cattle, pl.
16—Doncaster, cattle, horse, st.
17—Bedford, cattle, pigs
17—Manchester, cattle, horse
17, 18—Andover, cattle, sheep
19—Abergavenny, stock
22—Altrincham, cattle, general
22—Chester, cattle, h., sh., pigs
22—Congleton, cattle, horse
22, 23—Guildford, cattle, h., sh.
23—Louth, cattle
23—Ripon, cattle, horse
29—Ashbourne, cattle
29—Gloucester, cattle
29—Northampton, cattle

Memoranda.

NOVEMBER.

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DECEMBER 31 Days

THE MOON'S CHANGES.

● New Moon, 2nd, 2.56 a.m. | ○ Full Moon, 16th, 3.36 p.m.
☽ First Quar., 8th, 6.38 p.m. | ☾ Last Qr., 24th, 6.57 p.m.
● New Moon, 31st, 1.56 p.m.

			BREEDER'S KALENDAR SEE FOOT OF PAGE 2					Day of Year.
			Mare	Cow	Ewe	Sow	Bitch	
			Nov.	Sept.	April	Mar.	Jan.	
1	W	Princess of Wales born, 1844	6	12	24	31	31	336
2	TH	The *Coup d'Etat*, 1851	7	13	25	April 1	Feb. 1	337
3	F	Battle of Hohenlinden, 1800	8	14	26	2	2	338
4	S	*St. Barbara.* Sun r. 7h. 50m., s. 3h. 51m.	9	15	27	3	3	339
5	𝕾	2nd SUNDAY in ADVENT [1878	10	16	28	4	4	340
6	M	*St. Nicholas.* Whyte-Melville kld. Dec. 5	11	17	29	5	5	341
7	TU	*St. Ambrose.* Prince of Wales ill, 1878	12	18	30	6	6	342
8	W	*Conception of the Blessed Virgin Mary*	13	19	May 1	7	7	343
9	TH	Grouse Shooting ends. Great Frost, '71	14	20	2	8	8	344
10	F	Capture of Plevna, 1877	15	21	3	9	9	345
11	S	Length of day, 7h. 51m.	16	22	4	10	10	346
12	𝕾	3rd SUNDAY in ADVENT	17	23	5	11	11	347
13	M	*St. Lucy.* New Zealand discovered, 1642	18	24	6	12	12	348
14	TU	Albert, Prince Consort died, 1861	19	25	7	13	13	349
15	W	Queen visited Lord Beaconsfield, 1877	20	26	8	14	14	350
16	TH	Cambridge Michealmas Term ends	21	27	9	15	15	351
17	F	Oxford Michaelmas Term ends	22	28	10	16	16	352
18	S	Slavery abolished in U.S., 1862	23	29	11	17	17	353
19	𝕾	4th SUNDAY in ADVENT	24	30	12	18	18	354
20	M		25	Oct. 1	13	19	19	355
21	TU	*St. Thomas.* L. Beaconsfield born, 1805	26	2	14	20	20	356
22	W	Great cold, 1877. Winter commences	27	3	15	21	21	357
23	TH	New Turkish Constitution formed, 1876	28	4	16	22	22	358
24	F	Thackeray died, 1863	29	5	17	23	23	359
25	S	Christmas Day.	30	6	18	24	24	360
26	𝕾	1st SUNDAY aft. CHRISTMAS. *St. Stephen*	Dec. 1	7	19	25	25	361
27	M	*St. John.* Comet appeared, 1823	2	8	20	26	26	362
28	TU	*Holy Innocents' Day*	3	9	21	27	27	363
29	W	W. E. Gladstone born, 1809	4	10	22	28	28	364
30	TH	Alfonso proclaimed King of Spain, 1874	5	11	23	29	29	365
31	F	*St. Sylvester.* Sun nearest earth	6	12	24	30	Mar 1	366

December.

1, 2—Warrington, cattle, horse
3—Spalding, store, cattle
4—Nantwich, cattle
6—Bodmin, cattle, sheep
6—Northwich, cattle, general
7—Leigh, cattle
8—Leicester, cattle, horse, sheep
9—Evesham
9—Reigate, cattle, pleasure
9—Swindon, stock, pigs
9, 11—Bradford, cattle, h., pl.
10—Melton Mowbray, cattle
13—Chester, cattle, h., sh., pigs
14—Thirsk, pleasure
15, 20—York, horses
16—Oakham, cattle, horses, sheep
19—Bedford, cattle
24, 31—Manchester, pleasure
27—Leek, cattle
27—Sheffield, cattle, horses, sheep
28—Ulverstone, horses

Memoranda.

DECEMBER.

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The Court and Cabinet.

THE ROYAL FAMILY.

THE QUEEN.—VICTORIA, born May 24, 1819; succeeded to the throne June 20, 1837; crowned June 28, 1838; and married Feb. 10, 1840, to Prince ALBERT (born Aug. 26, 1819, and died Dec. 14, 1861). Her Majesty is the only child of the late Edward, Duke of Kent, son of King George III. The Children of Her Majesty are:—

1. VICTORIA, Princess Royal, born Nov. 21, 1840, married to Prince Frederick-William of Prussia, Jan. 25, 1858, and has issue four sons and four daughters.
2. ALBERT-EDWARD, Prince of Wales, born Nov. 9, 1841; married, March 10, 1863, to Princess ALEXANDRA of Denmark, born Dec. 1, 1844, and has issue two sons and three daughters—Albert, born Jan. 8, 1864; George, born June 3, 1865; Louisa, born February 20, 1867; Victoria, born July 6, 1868; Maud, born Nov. 26, 1869; and Alexander, born April 6, 1871, died April 7, 1871.
3. ALICE, born April 25, 1843; married to Prince Frederick Louis of Hesse, July 1, 1862; died Dec. 14, 1878; issue, five daughters and one son.
4. ALFRED, Duke of Edinburgh, born Aug. 6, 1844; married Jan. 23, 1874, to Marie-Alexandrovna, only daughter of the Emperor of Russia, and has issue one son and three daughters.
5. HELENA, born May 25, 1846; married July 5, 1866, Prince Frederick Christian of Schleswig-Holstein, and has issue two sons and two daughters.
6. LOUISE, born March 18, 1848; married March 21, 1871, to John Douglas, Marquis of Lorne, eldest son of the Duke of Argyll.
7. ARTHUR, Duke of Connaught, born May 1, 1850; married March 13, 1879, to Princess Margaret of Prussia.
8. LEOPOLD, born April 7, 1853.
9. BEATRICE, born April 14, 1857.

GEORGE, Duke of Cambridge, K.G., cousin to Her Majesty, born March 26, 1819.

AUGUSTA, Duchess of Cambridge, aunt to Her Majesty, born July 25, 1795; married, May 17, 1818, to the late Duke of Cambridge.

ERNEST, second Duke of Cumberland, son of the ex-King of Hanover, born Sept. 21, 1845.

AUGUSTA, daughter of the late Duke of Cambridge, and cousin to Her Majesty, born July 19, 1822, married, June 28, 1843, to Frederick, Grand Duke of Mecklenburg-Strelitz, and has issue a son.

MARY, Princess Teck, daughter of the late Duke of Cambridge, and cousin to Her Majesty, born Nov. 27, 1833; married June 7, 1866, Prince Teck, and has issue two sons and one daughter.

HER MAJESTY'S MINISTERS.

First Lord of the Treasury.—Earl of Beaconsfield.
Lord High Chancellor.—Earl Cairns.
Lord President of the Council.—Duke of Richmond.
Lord Privy Seal.—Duke of Northumberland.
Chancellor of the Exchequer.—Sir S. H. Northcote, Bt.
Secretary for Home Department.—R. A. Cross.
Secretary for Foreign Affairs.—Marquis of Salisbury.
Secretary for Colonies.—Sir M. H. Beach.
Secretary for War.—F. A. Stanley.
Secretary for India.—Viscount Cranbrook.
First Lord of the Admiralty.—W. H. Smith.
Postmaster General.—Lord John Manners.
President of the Board of Trade.—Viscount Sandon.

The above form the Cabinet.

First Commissioner of Works.—G. J. Noel.
President of the Local Government Board.—G. S. Booth.
President, Council of Education.—Duke of Richmond.
Chancellor of the Duchy of Lancaster.—Col. T. Taylor.
Judge Advocate General.—G. A. C. Bentinck.
Lord Great Chamberlain.—Lord Aveland.
Chairman of Inland Revenue.—C. J. Harries.
Registrar-General.—George Graham.

SCOTLAND.

Lord High Constable.—Earl of Erroll.
Keeper of the Great Seal.—Earl of Selkirk.
Master of the Household.—Duke of Argyll.
Lord High Commissioner.—Earl of Rosslyn.
Lord Justice General.—John Inglis.
Lord Justice Clerk.—Lord Moncreiff.
Lord-Advocate.—W. Watson.
Solicitor-General.—J. H. A. Macdonald.
Commander of the Forces.—Major-Gen. R. Bruce.

IRELAND.

Lord-Lieutenant.—Duke of Marlborough.
Chief-Secretary.—J. Lowther.
Private Secretaries.—P. B. Bernard, C. Beresford.
Lord Chancellor.—Dr. Ball.
State Steward—Earl of Wicklow.
Attorney-General.—E. Gibson.
Solicitor-General.—H. Holmes.
Commander of the Forces.—General Sir J. Michel.

THE ROYAL HOUSEHOLD.

LORD STEWARD'S DEPARTMENT.

Lord Steward.—Earl Beauchamp.
Treasurer.—Lord Henry Thynne.
Comptroller.—Lord Henry Somerset.
Master of the Household.—Sir J. C. Cowell.
Secretary of Board of Green Cloth.—E. M. Browell.
Paymaster of the Household.—T. C. March.

LORD CHAMBERLAIN'S DEPARTMENT.

Lord Chamberlain.—Marquis of Hertford.
Vice-Chamberlain.—Viscount Barrington.
Comptroller.—S. C. B. Ponsonby Fane.
Chief-Clerk.—G. T. Hertslet.
Keeper of Privy Purse.—Lt.-Gen. Sir T. M. Biddulph.
Private Sec. to Her Majesty.—Lt.-Gen. H. Ponsonby.
Secretary.—D. C. Bell.
Captain, Yeomen of Guard.—Lord Skelmersdale.
Captain of Gentlemen-at-Arms.—Earl of Coventry.
Master of Ceremonies.—Gen. Sir F. Seymour, Bt.
Lord High Almoner.—Dean of Windsor.
Dean of Chapel Royal.—Bishop of London.
Mistress of the Robes.—Duchess of Wellington.
Groom of the Stole.—H. D. Erskine.

MASTER OF THE HORSE'S DEPARTMENT.

Master of the Horse.—Earl of Bradford.
Clerk-Marshal.—Lord Alfred Paget.
Crown Equerry and Secretary.—Col. G. A. Maude.
Master of the Buckhounds.—Earl of Hardwicke.

Imperial Parliament.

ALPHABETICAL LIST OF THE HOUSE OF PEERS.

The Names of Roman Catholic Peers are printed in *Italics*

Speaker—LORD CAIRNS, Lord Chancellor.

Abercorn, D
Abercromby, L
Aberdare, L
Aberdeen, E
Abergavenny, M
Abingdon, E
Abinger, L
Acton, L
Ailesbury, M
Ailsa, M
Airey, L
Airlie, E
Albemarle, E
Alington, L
Amherst, E
Anglesey, M
Annaly, L
Annesley, E
Argyll, D
Arundell, L
Ashburnham, E
Ashburton, L
Athlumney, L
Athole, D
Auckland, L
Aveland, L
Aylesford, E
Bagot, L
Balford of Bur, L
Bangor, Bp
Bangor, V
Bantry, E
Bateman, L
Bath, M
Bath & Wells, Bp
Bathurst, E
Beaconsfield, E
Beauchamp, E
Beaufort, D
Beaumont, L
Bedford, D
Belmore, E
Belper, L
Berkeley, E
Berwick, L
Bessborough, E
Blachford, L
Blackburn, L
Blantyre, L
Bloomfield, L
Bolingbroke, V
Bolton, L
Boston, L
Boyne, V
Bradford, E
Braybrooke, L
Breadalbane, E
Bridport, V
Bristol, M
Brougham, L
Brownlow, E
Buccleuch, D
Buckingham, D
Buckinghamsh, E
Bury, V
Bute, M
Byron, L
Cadogan, E
Cairns, L
Caithness, E
Caledon, E
Calthorpe, L
CAMBRIDGE, D
Camden, M
Camoys, L
Camperdown, E
Canterbury, Abp
Canterbury, V
Cardwell, V
Carew, L
Carlingford, L
Carlisle, Bp
Carlisle, E
Carnarvon, E
Carrington, L
Carysfort, E
Castlemaine, L
Castletown, L
Cathcart, E
Cawdor, E
Charlemont, E
Chelmsford, L
Chesham, L
Chester, Bp
Chesterfield, E
Chichester, Bp
Chichester, E
Cholmondeley, M
Churchill, L
Churston, L
Clancarty, E
Clanricarde, M
Clanwilliam, E
Clarendon, E
Clermont, L
Cleveland, D
Clifden, V
Clifford, L
Clinton, L
Clonbrock, L
Cloncurry, L
Clonmell, E
Colchester, L
Coleridge, L
Colville of Culrs, L
Combermere, V
Congleton, L
CONNAUGHT, D
Conyers, L
Conyngham, M
Cork & Orrery, E
Cottenham, E
Cottesloe, L
Courtown, E
Coventry, E
Cowley, E
Cowper, E
Cranbrook, V
Craven, V
Crawford E
Crewe, L
Crofton, L
CUMBERLAND, D
Dacre, L
Dalhousie, E
Darnley, E
Dartmouth, E
Dartrey, E
De Clifford, L
De Freyne, L
Delamere, L
De La Warr, E
De L'Isle & Dud, L
De Mauley, L
Denbigh, E
Denman, L
Derby, E
De Ros, L
De Saumarez, L
De Tabley, L
Devon, E
Devonshire, D
Digby, L
Dynevor, L
Donegall, M
Doneraile, V
Donoughmore, E
Dorchester, L
Dormer, L
Downshire, M
Drogheda, M
Ducie, E
Dudley, E
Dufferin, E
Dunboyne, L
Dunmore, E
Dunraven, E
Dunsandle, L
Dunsany, L
Durham, Bp
Durham, E
Ebury, L
EDINBURGH, D
Effingham, E
Egerton, L
Eglintoun, E
Egmont, E
Eldon, E
Elgin, E
Ellenborough, L
Ellesmere, E
Elphinstone, L
Ely, Bp
Ely, M
Emly, L
Enfield, V
Enniskillen, E
Erne, E
Erroll, E
Erskine, L
Essex, E
Eversley, V
Exeter, Bp
Exeter, M
Exmouth, V
Falkland, V
Falmouth, V
Ferrers, E
Feversham, E
Fife, E
Fingall, E
Fitzhardinge, L
Fitzwilliam, E
Foley, L
Forbes, L
Forester, L
Fortescue, E
Gage, V
Gainsborough E
Galloway, E
Gardner, L
Gerard, L
Gifford, L
Glasgow, E
Gloster & Brist, Bp
Gordon of D., L
Gormanston, V
Gosford, E
Gough, V
Grafton, D
Granard, E
Grantley, L
Granville, E
Greville, L
Grey, E
Grey de Wilton, V
Guilford, E
Gwydir, L
Haddington, E
Halifax, V
Hamilton, D
Hammond, L
Hampton, L
Hanmer, L
Hardinge, V
Hardwicke, E
Harewood, E
Harlech, L
Harrington, E
Harris, L
Harrowby, E
Hastings, L
Hatherley, L
Hatherton, L
Hawarden, V
Hawke, L
Headfort, M
Henniker, L
Hereford, Bp
Hereford, V
Hertford, M
Heytesbury, L
Hill, V
Home, E
Hood, V
Hopetoun, E
Houghton, L
Howard deWal, L
Howard of Glos, L
Howe, E
Huntingdon, E
Huntly, M
Hylton, L
Ilchester, E
Inchiquin, L
Jersey, E
Keane, L
Kenmare, E
Kenyon, L
Kesteven, L
Kimberley, E
Kinnaird, L
Kinnoul, E
Kintore, E
Lanerton, L
Lanesborough, E
Lansdowne, M
Lawrence, L
Leconfield, L
Leeds, D
Leicester, E
Leigh, L
Leinster, D
Leitrim, E
Lichfield, E
Lifford, V
Lilford, L
Limerick, E
Lincoln, Bp
Lindsey, E
Lismore, V
Listowel, E
Llandaff, Bp
Londesborough, L
London, Bp
Londonderry, M
Longford, E
Lonsdale, E
Lothian, M
Loudon, E
Lovat, L
Lovelace, E
Lucan, E
Lurgan, L
Lyons, L
Lyttelton, L
Lytton, L
Lyveden, L
Macclesfield, E
Malmesbury, E
Manchester, Bp
Manchester, D
Manners, L
Mansfield, E
Manvers, E
Mar and Kellie, E
Marlborough, D
Massareene, V
Massy, L
Meath, E
Melville, V
Methuen, L
Middleton, L
Midleton, V
Minto, E
Monck, V
Moncreiff, L
Monson, L
Monteagle, L
Montrose, D
Moray, E
Morley, E
Morton, E
Mostyn, L
Mount Cashell, E
Mt-Edgcumbe, E
Mowbray, L
Munster, E
Napier of Mag., L
Napier, L
Nelson, E
Newcastle, D
Norfolk, D
Normanby, M
Normanton, E
Northampton, M
Northbrook, E
N'thumberl'nd, D
Northwick, L
Norton, L
Norwich, Bp
O'Hagan, L
O'Neill, L
Onslow, E
Oranmore, L
Orford, E
Ormathwaite, L
Ormonde, M
Overstone, L
Oxford, Bp
Pembroke, E
Penrhyn, L
Penzance, L
Peterborough, Bp
Petre, L
Plunket, L
Poltimore, L
Portarlington, E
Portland, D
Portman, V
Portsmouth, E
Poulett, E
Powerscourt, V
Powis, E
Queensberry, M
Radnor, E
Raglan, L
Ranfurly, E
Ravensworth, E
Rayleigh, L
Redesdale, E
Ribblesdale, L
Richmond, D
Ripon, Bp
Ripon, M
Rivers, L
Robartes, L
Roden, E
Rodney, L
Rollo, L
Romilly, L
Romney, E
Rosebery, E
Rosse, E
Rosslyn, E
Rossmore, L
Roxburghe, D
Russell, E
Rutland, D
Sackville, L
St Albans, Bp
St Albans, D
St Asaph, Bp
St Davids, Bp
St Germans, E
St John, L
St Leonards, L
St Vincent, V
Salisbury, Bp
Salisbury, M
Saltoun, L
Sandhurst, L
Sandwich, E
Sandys, L

Saye and Sele, L
Scarborough, E
Scarsdale, L
Seafield, E
Seaton, L
Sefton, E
Selborne, L
Selkirk, E
Shaftesbury, E
Shannon, E
Sheffield, E
Sherborne, L
Shrewsbury, E
Sidmouth, V
Sinclair, L
Skelmersdale, L
Sligo, M
Somers, E
Somerset, D
Sondes, L
Southampton, L
Southesk, E
Spencer, E
Stafford, L
Stair, E
Stamford, E
Stanhope, E
Stanley of Alder, L
Stradbroke, E
Strafford, E
Stratford de R, V
Strathallan, V
Stratheden, L
Strathmore, E
Strathnairn, L
Sudeley, L
Suffield, L
Suffolk, E
Sutherland, D
Sydney, E
Talbot de Mal, L
Tankerville, E
Templemore, L
Templetown, V
Tenterden, L
Teynham, L
Thurlow, L
Tollemache, L
Torrington, V
Townshend, M
Tredegar, L
Truro, L
Vaux, L
Ventry, L
Vernon, L
Verulam, E
Vivian, L
Waldegrave, E
WALES, Prince of
Walsingham, L
Warwick, E
Waterford, M
Waveney, L
Wellington, D
Wemyss, E
Wenlock, L
Wentworth, L
Westbury, L
Westminster, D
Westmoreland, E
Wharncliffe, E
Wicklow, E
Willoughby, L
Wilton, E
Winchester, Bp
Winchester, M
Winchilsea, E
Windsor, L
Winmarleigh, L
Wolverton, L
Worcester, Bp
Wrottesley, L
Wynford, L
Yarborough, E
York, Abp
Zetland, E
Zouche, L

LIST OF THE MEMBERS OF THE HOUSE OF COMMONS.

ENGLAND AND WALES—489 *Members.*

The Counties are printed in SMALL CAPITALS.

Speaker—HENRY B. BRAND.

Abingdon	J. C. Clarke
Andover	Lt.-Col. H. Wellesley
ANGLESEY	R. Davies
Ashton-un-Lyne	T. W. Mellor
Aylesbury	Sir N. de Rothschild S. G. Smith
Banbury	B. Samuelson
Barnstaple	T. Cave S. D. Waddy
Bath	Lt.-Col. A. Hayter Lt.-Col. N. Bousfield
Beaumaris, &c.	M. Lloyd
BEDFORD	Col. Sir R. Gilpin, Bt. Marquis of Tavistock
Bedford	S. Whitbread Capt. F. C. Turner
BERKS	Lieut.-Col. Lindsay J. Walter P. Wroughton
B'rwick-on-Twd	Sir D. Marjoribanks Capt. D. Milne Holme
Bewdley	C. Harrison
Birkennead	D. M'Iver
Birminghead	P. H. Muntz John Bright Joseph Chamberlain
Blackburn	W. E. Briggs D. Thwaites
Bodmin	E. Leveson-Gower
Bolton	J. Hick J. K. Cross
Boston	W. J. Ingram R. Garfitt
Bradford	W. E. Forster H. W. Ripley
BRECKNOCK	W. F. Maitland
Brecknock	J. P. W. G. Holford
Bridgnorth	W. H. Foster
Bridport	P. Ralli
Brighton	J. L. Ashbury Lt.-Gen. C. C. Shute
Bristol	S. Morley L. Fry
BUCKS	Sir R. B. Harvey, Bt. N. G. Lambert T. F. Fremantle
Buckingham	E. J. Hubbard
Burnley	P. Rylands
Bury (Lanc.)	R. N. Philips
Bury St. Edmund's	E. Greene Lord F. Hervey
Calne	Lord Fitzmaurice
CAMBRIDGE	H. B. W. Brand B. B. H. Rodwell E. Hicks
Cambridge	A. G. Marten P. E. Smollett
Cambridge University	S. H. Walpole A. J. Beresford-Hope
Canterbury	Colonel Laurie A. E. Gathorne Hardy
Cardiff, &c.	Lieut.-Col. Stuart
CARDIGAN	T. E. Lloyd
Cardigan, &c.	David Davies
Carlisle	R. Ferguson Sir W. Lawson, Bt.
CARMARTHEN	Viscount Emlyn J. Jones
Carmarthen, &c.	B. T. Williams
CARNARVON	G. C. Pennant
Carnarvon, &c.	W. B. Hughes
Chatham	J. E. Gorst
Chelsea	Sir C. W. Dilke, Bt. W. Gordon
Cheltenham	J. T. A. Gardner
CHESTER, East	W. J. Legh W. C. Brooks
Mid	W. Egerton P. E. Warburton
West	Sir P. Egerton W. F. Tollemache
Chester	H. C. Raikes J. G. Dodson
Chichester	Lord Henry Lennox
Chippenham	G. Goldney
Christchurch	Sir H. D. Wolff
Cirencester	Capt. T. W. C. Master
Clitheroe	R. Assheton
Cockermouth	
Colchester	Lt.-Col. Learmonth
CORNWALL, East	Sir C. Rashleigh, Bt. J. Tremayne
West	Sir J. St. Aubyn A. P. Vivian
Coventry	H. W. Eaton Sir H. M. Jackson
Cricklade, &c.	Sir D. Gooch, Bart. A. L. Goddard
CUMBERL'ND East	G. Howard E. S. Howard
West	P. S. Wyndham Lord Muncaster
Darlington	E. Blackhouse
DENBIGH	Sir W. W. Wynn, Bt G. O. Morgan
Denbigh, &c.	W. Williams
DERBY, North	Ld. G. H. Cavendish A. P. Arkwright
South	Col. Sir H. Wilmot, Bt T. W. Evans
East	R.-Admiral Egerton F. Arkwright
Derby	M. T. Bass S. Plimsoll
Devizes	Sir T. Bateson, Bart.
Devonport	J. H. Puleston Capt. G. E. Price
DEVON, North	Sir S. Northcote, Bt. Sir T. D. Acland, Bt.
South	Sir M. Lopes, Bart. J. C. Garnier
East	Sir L. Palk, Bart. Sir J. H. Kennaway
Dewsbury	Serjeant J. Simon
Dorchester	W. E. Brymer
DORSET	W. H. Portman J. Floyer Lt.-Col. E. H. Digby
Dover	C. K. Freshfield Major A. G. Dickson
Droitwich	J. Corbett
Dudley	H. B. Sheridan
DURHAM, N.	C. M. Palmer Sir G. Elliot, Bart.
South	J. W. Pease Lt.-Col. F. Beaumont
Durham	F. Herschell Sir A. E. Middleton
ESSEX, South	T. C. Baring Col. W. T. Makins
East	J. Round Lt-Col. S. B. R. Brise

ESSEX, West	Sir H.J.Selwin Ibbetson, Bart.
	Ld. E.H.B. G. Cecil
Evesham	Col. J. Bourne
Exeter	A. Mills
	J. G. Johnson
Eye	Viscount Barrington
Finsbury	W. T. M'C. Torrens
	Ald. Sir A. Lusk. Bt.
FLINT	Lord R. Grosvenor
Flint, &c.	J. Roberts
Frome	H. Samuelson
Gateshead	W. H. James
GLAMORGAN	H. H. Vivian
	C. R. M. Talbot
GLOUCESTER East	SirM.E.H.Beach, Bt
	J. R. Yorke
West	R. R. E. Plunket
	Col. Kingscote
Gloucester	W. K. Wait
	C. J. Monk
Grantham	Sir H. A. Cholmeley
	Major H. F. C. Cust
Gravesend	Capt. B. Pim
Greenwich	T. W. Boord
	W. E. Gladstone
Grimsby, Great	A. M. Watkin
Guildford	D. R. Onslow
Hackney	J. Holmes
	H. Fawcett
Halifax	J. Stansfield
	J. D. Hutchinson
HANTS, North	G. Sclater-Booth
	W. W. B. Beach
South	Ld.H. J. M. D. Scott
	W. Cowper-Temple
Hartlepool	I. L. Bell
Harwich	Col. H. J. W. Jervis
Hastings	T. Brassey
	Sir U. Shuttleworth
Haverfordwest	Lord Kensington
Helston	A. W. Young
Hertford	A. J. Balfour
HEREFORD	Sir J. R. Bailey, Bt.
	M. Biddulph
	Major D. P. Peploe
Hereford	G. Clive
	Lt-Col. G. Arbuthnot
HERTFORD	T. F. Halsey
	A. Smith
	H. F. Cowper
Horsham	J. C. Brown
Huddersfield	E. A. Leatham
HUNTINGDON	E. Fellowes
	Viscount Mandeville
Huntingdon	Visc. Hinchingbrook
Hythe	Sir E. W. Watkin
Ipswich	J. R. Bulwer
	T. C. Cobbold
Kendal	J. Whitwell
KENT, East	E. L. Pemberton
	W. Deedes
Mid	Sir W. H. Dyke, Bt.
	Visct. Holmesdale
West	Sir C. H. Mills, Bt.
	Viscount Lewisham
Kidderminster	Sir W. A. Fraser, Bt.
Kingston-on-Hull	C. H. Wilson
	C. M. Norwood.
Knaresborough	B. T. Woodd
Lambeth	Ald. Sir J. Lawrence
	Ald. W. M'Arthur
LANCASTER North	F. A. Stanley
	T. H. Clifton
North-East	J. M. Holt
	J. P. C. Starkie
South-East	A. F. Egerton
	E. Hardcastle
LANCASTER South-West	R. A. Cross
	Col. Blackburne
Launceston	Sir H. Giffard
Leeds	W. St.J. Wheelhouse
	R. Tennant
	J. Barran
LEICESTER, N.	Lord J. Manners
	S. W. Clowes
South	A. Pell
	W. U. Heygate
Leicester	P. A. Taylor
	A. McArthur
Leominster	T. Blake
Lewes	W. L. Christie
Lichfield	Col. R. Dyott
LINCOLN, N.	R. Winn
	Sir J. D. Astley, Bt.
Mid	H. Chaplin
	E. Stanhope
South	Sir Welby-Gregory
	E. Turnor
Lincoln	Lt.-Col. E. Chaplin
	C. Seely
Liskeard	L. H. Courtney
Liverpool	Viscount Sandon
	J. Torr
	W. Rathbone
London	Ald. W. J. R. Cotton
	P. Twells
	J. G. Hubbard
	G. J. Goschen
London Univer.	R. Lowe
Ludlow	Lt.-Col. G. W. Clive
Lymington	Lt.-Col. E. Kennard
Lynn Regis	R. Bourke
	Lord C. J. Hamilton
Macclesfield	W. C. Brocklehurst
	D. Chadwick
Maidstone	Sir J. Lubbock, Bt.
	SirS H Waterlow, Bt.
Maldon	G. Courtauld
Malmesbury	W. Powell
Manchester	H. Birley
	Sir T. Bazley, Bart.
	Jacob Bright
Malton	C. W. Fitzwilliam
Marlborough	Lord C. W. Bruce
Marlow, Great	T. O. Wethered
Marylebone	W. Forsyth
	Sir T. Chambers
MERIONETH	S. Holland
Merthyr Tydvil	H. Richard
	R. Fothergill
Middlesboro'	I. Wilson
MIDDLESEX	Lord G. F. Hamilton
	O. E. Coope
Midhurst	Sir H. T. Holland
MONMOUTH	Ld H.R.C. Somerset
	Col. F. C. Morgan
Monmouth, &c.	T. Cordes
MONTGOMERY	C. W. W. Wynn
Montgomery &c	F. Hanbury-Tracy
Morpeth	T. Burt
Newark	T. Earp
	S. B. Bristow
Newcastle-under-Lyne	W. S. Allen
	S. R. Edge
Newcastle-on-Tyne	J. Cowen
	C. F. Hammond
Newport, I. of W.	C. C. Clifford
NORFOLK, N.	Sir E H K Lacon, Bt.
	E. Birkbeck
South	C. S. Read
	Sir R. J. Buxton, Bt.
West	Sir W. Bagge, Bart.
	G. W. P. Bentinck
Northallerton	G. W. Elliot
N'RTH'MPTON North	S. G. S. Sackville
	Lord Burghley
South	Sir R. Knightley, Bt.
	Mj. F.W. Cartwright
Northampton	P. Phipps
	C. G. Merewether
NORTHUMBER North	Earl Percy
	Sir M. W. Ridley
South	W. B. Beaumont
	E. Ridley
Norwich	J. J. Colman
	Vacant
NOTTINGHAM North	F. C. Smith
	Viscount Galway
South	T. B. T. Hildyard
	G. Storer
Nottingham	W. E. Denison
	S. Isaac
Oldham	Serjt. F. L. Spinks
	J. T. Hibbert
OXFORD	Lieut. - Col. J. S. North
	W. C. Cartwright
	Lt.-Col. E. Harcourt
Oxford	Sir W. V. Harcourt
	A. W. Hall
Oxford Univer.	J. R. Mowbray
	J. G. Talbot
PEMBROKE	J. B. Bowen
Pembroke, &c.	E. J. Reed
Penryn and Falmouth	D. J. Jenkins
	H. T. Cole
Peterborough	T. Hankey
	Hn. J. W. Fitzwilliam
Petersfield	W. S. H. Jolliffe
Plymouth	E. Bates
	S. S. Lloyd
Pontefract	H. C. E. Childers
	Maj. S. Waterhouse
Poole	A. E. Ashley
Portsmouth	Sir J. D. Elphinstone
	T. C. Bruce
Preston	E. Hermon
	Sir J. Holker
RADNOR	A. Walsh
Radnor, New	Marq. of Hartington
Reading	G. J. S. Lefevre
	G. Palmer
Retford, East	F. J. S. Foljambe
	W. B. Denison
Richmond	J. C. Dundas
Ripon	Earl de Grey
Rochdale	T. B. Potter
Rochester	A. J. Otway
	P. W. Martin
RUTLAND	G. J. Noel
	G. H. Finch
Rye	J. S. Gathorne-Hardy
St. Ives	C. T. Praed
Salford	W. T. Charley
	Lt.-Col. O. Walker
Salisbury	G. R. D. Ryder
	Dr J. A. Lush
Sandwich	H. A. Brassey
	E. H. Knatchbull-Hugessen
Scarborough	Sir C. Legard, Bart
	Sir H. Johnstone, Bt.
Shaftesbury	V. F. B. Stanford
Sheffield	J. A. Roebuck
	A. J. Mundella
Shields, South	J. C. Stevenson
Shoreham, New, &c.	S. Cave
	Sir W. W. Burrell
Shrewsbury	C. C. Cotes
	H. Robertson

SHROPSHIRE, North	Viscount Newport
	S. Leighton
South	J. E. Severne
	Sir B. Leighton, Bt.
SOMERSET, East	Major R. S. Allen
	Sir P. J. W. Miles, Bt
Mid	R. H. Paget
	W. S. G. Langton
West	Capt. A. W. N. Hood
	Major V. H. V. Lee
Southampton	Sir F. Perkins
	A. Giles
Southwark	J. Locke
	Col. M. Beresford
STAFFORD, N.	C. M. Campbell
	R. W. Hanbury
East	M. A. Bass
	S. C. Allsopp
West	F. Monckton
	A. S. Hill
Stafford	T. Salt
	A. Macdonald
Staleybridge	T. H. Sidebottom
Stamford	Adm. Sir J. C. D. Hay, Bart.
Stockport	C. H. Hopwood
	F. Pennington
Stockton	J. Dodds
Stoke-upon-Trent	R. Heath
	Dr Kenealy
Stroud	A. J. Stanton
	S. S. Marling
SUFFOLK, East	Lord Rendlesham
	Lt.-Col. F. Barne
West	Lt.-Col. W. Parker
	T. Thornhill
Sunderland	E. T. Gourley
	Maj. Gen. Sir H. M. Havelock
SURREY, East	J. Watney
	W. Grantham
SURREY, Mid	Sir H. W. Peek
	Sir T. Lawrence
West	G. Cubitt
	L. Steere
SUSSEX, East	G. B. Gregory
	M. D. Scott
West	Lt-Cl Sir W. Barttelot
	Earl of March
Swansea, &c.	L. L. Dillwyn
Tamworth	Sir R. Peel, Bart.
	H. A. Bass
Taunton	A. C. Barclay
	Sir H. James
Tavistock	Lord A. J. Russell
Tewkesbury	W. E. Price
Thirsk	Sir W. Gallwey, Bt.
Tiverton	Sir J. H. Amory
	W. N. Massey
Tower Hamlets	Capt. C. T. Ritchie
	J. D'A. Samuda
Truro	Col. Sir J. Hogg
	Col. A. Tremayne
Tynemouth	T. E. Smith
Wakefield	T. K. Sanderson
Wallingford	E. Wells
Walsall	Sir C. Forster
Wareham	J. S. W. S. E. Drax
Warrington	Sir G. Greenall, Bt.
WARWICK, N.	C. N. Newdegate
	W. B. Davenport
South	Earl of Yarmouth
	Sir J. E. Wilmot, Bt.
Warwick	G. W. J. Repton
	A. W. Peel
Wednesbury	A. Brogden
Wenlock	A. H. Brown
	C. T. W. Forester
Westbury	A. Laverton
Westminster	W. H. Smith
	Sir C. Russell, Bt.
WESTMORLAND	Earl of Bective
	W. Lowther
Weymouth & Melc. Regis	H. Edwards
	Sir F. Johnstone, Bt.
Whitby	W. H. Gladstone
Whitehaven	G. A. C. Bentinck
Wigan	Lord Lindsay
	T. Knowles
Wight, Isle of	A. Baillie Cochrane
Wilton	S. Herbert
WILTS, North	G. S. Estcourt
	Sir G. S. Jenkinson
South	Lord H. F. Thynne
	Viscount Folkestone
Winchester	W. B. Simonds
	A. R. Naghten
Windsor	R. R. Gardner
Wolverhampton	C. P. Villiers,
	T. M. Weguelin
Woodstock	Lord R. Churchill
WORCESTER East	H. Allsopp
	T. E. Walker
West	F. W. Knight
	Sir E. H. Lechmere
Worcester	T. R. Hill
	J. D. Allcroft
Wycombe	Lt.-Col. Carington
YORK, North Riding	F. A. Milbank
	Viscount Helmsley
East Rid.	C. Sykes
	W. H. H. Broadley
WestRid. North	Lord F. C. Cavendish
	Sir M. Wilson, Bt.
WestRid. South	W. T. W. S. Stanhope
	L. R. Starkey
WestRid. East	C. B. Denison
	J. Fielden
York	G. Leeman
	J. Lowther

IRELAND—103 *Members.*

ANTRIM	J. Chaine
	E. O'Neill
ARMAGH	E. W. Verner
	M. C. Close
Armagh	Capt. G. Beresford
Athlone	E. Shiel
Bandon	A. Swanston
Belfast	J. P. Corry
	W. Ewart
CARLOW	H. Bruen
	A. Kavanagh
Carlow	H. O. Lewis
Carrickfergus	M. R. Dalway
CAVAN	C. J. Fay
	J. G. Biggar
CLARE	Lord F. Conyngham
	Sir B. Loghlen, Bart.
Clonmel	A. J. Moore
Coleraine	D. Taylor
CORK	W. Shaw
	Col. Colthurst
Cork	N. D. Murphy
	W. Goulding
DONEGAL	Marquis of Hamilton
DOWN	Lord A. E. H. Trevor
	Viscount Castlereagh
Downpatrick	J. Mulholland
Drogheda	Dr W. H. O'Leary
DUBLIN	I. T. Hamilton
	Lieut.-Col. Taylor
Dublin	Sir A. Guinness, Bt.
	M. Brooks
Dublin Univer.	D. R. Plunket
	E. Gibson
Dundalk	P. Callan
Dungannon	T. A. Dickson
Dungarvan	F. H. O'Donnell
Ennis	Lysaght Finegan
Enniskillen	Viscount Crichton
FERMANAGH	W. H. Archdale
	Lieut-Col H. A. Cole
GALWAY	Major J. P. Nolan
	M. Henry
Galway	G. Morris
	Dr M. F. Ward
KERRY	H. A. Herbert
	R. P. Blennerhasset
KILDARE	C. H Meldon
	W. H. F. Cogan
KILKENNY	
	P. Martin
Kilkenny	B. Whitworth
KING'S Co	Sir P. O'Brien, Bart.
	Serjeant D. Sherlock
Kinsale	E. Collins
LEITRIM	Dr J. Brady
	Major F. O'Beirne
LIMERICK	W. H. O'Sullivan
	E. J. Synan
Limerick	R. O'Shaughnessy
	D. Fitz G. Gabbett
Lisburn	Sir R. Wallace, Bart.
LONDONDERRY	H. Law
	Sir T. McClure
Londonderry	C. E. Lewis
LONGFORD	Justin M'Carthy
	G. Errington
LOUTH	A. M. Sullivan
	G. H. Kirk
Mallow	J. G. MacCarthy
MAYO	G. E. Browne
	J. O'Connor Power
MEATH	N. Ennis
	C. S. Parnell
MONAGHAN	Sir J. Leslie, Bart.
	S. E. Shirley
NEW ROSS	Lt.-Col. Tottingham
Newry	W. Whitworth
Portarlington	Capt. L. D. Damer
QUEEN'S Co.	K. T. Digby
	E. Dease
ROSCOMMON	C. O. O'Conor
	C. French
SLIGO	D. M. O'Conor
	E. R. K. Harman
TIPPERARY	S. Moore
	E. D. Gray
Tralee	D. O'Donoghue
TYRONE	J. W. E. Macartney
	H. W. L. Corry
WATERFORD	Lord C. Beresford
	J. Delahunty
Waterford	R. Power
	Major P. O'Gorman
WESTMEATH	P. G. Smyth
	Lord R. Montagu
WEXFORD	Sir G. Bowyer, Bart.
	Chevalier K. O'Clery
Wexford	W. A. Redmond
WICKLOW	W. R. O'Byrne
	W. W. F. Dick
Youghal	Sir J. N. McKenna

HOUSE OF COMMONS

SCOTLAND—60 *Members.*

ABERDEEN, E.	Lt.-Gn. Sir A. Gordon
West	Lord D. Gordon
Aberdeen	J. F. Leith
ARGYLL	Lord C. Campbell
AYR, North	R. Montgomerie
South	Col. C. Alexander
Ayr, Irvine, &c.	Sir W. J. Cunningham
BANFF	R. W. Duff
BERWICK	R. B. Hamilton
BUTE	C. Dalrymple
CAITHNESS	Sir J. G. T. Sinclair, Bt.
CLACKMANNAN and KINROSS	W. P. Adam
DUMBARTON	A. O. Ewing
DUMFRIES	Capt. J. H. Johnstone
Dumfries, &c.	E. Noel
Dundee	J. Yeaman
	E. Jenkins
EDINBURGH	Earl of Dalkeith
Edinburgh	D. M'Laren
	J. Cowan
Edin & St Andrs Universities	Dr Lyon Playfair
ELGIN & NAIRN	Sir G. McP. Grant
Elgin, Banff, &c.	M. E. Grant Duff
Falkirk, &c	J. Ramsey
FIFE	Sir R. Anstruther, Bt.
FORFAR	J. W. Barclay
Glasgow	Dr. C. Cameron
	G. Anderson
	Chas. Tennant
Glasgow & Abrdn Universities	W. Watson
Greenock	J. Stewart
HADDINGTON	Lord Elcho
Haddington, &c.	Sir D. Wedderburn
Hawick, &c.	G. O. Trevelyan
INVERNESS,	D. Cameron
Inverness, &c.	C. F. Mackintosh
Kilmarnock, &c.	J. F. Harrison
KINCARDINE	Gen. Sir G. Balfour
Kirkaldy, &c.	Sir G. Campbell
KIRKCUDBRIGHT	J. Maitland
LANARK, N.	Sir T. Colebrooke, Bt
South	Sir W. Anstruther, Bt
Leith, &c.	A. Grant
LINLITHGOW	P. M'Lagan
Montrose, &c.	W. E. Baxter
ORKNY. & SHET.	S. Laing
Paisley	W. Holms
PEEBLES	Sir G. Montgomery
PERTH	Lt.-Col. D. Moray
Perth	C. S. Parker
RENFREW	Col. W. Mure
ROSS & CROMRTY	
ROXBURGH	Sir G. H. Douglas, Bt
St. Andrew's, &c.	E. Ellice
STIRLING	Sir W Edmondstne, Bt
Stirling, &c.	H. B. Bannerman
SUTHERLAND	Marquis of Stafford
Wick, &c.	J. Pender
WIGTON	R. V. Agnew
Wigton, &c.	M. J. Stewart

OFFICERS OF THE HOUSES OF PARLIAMENT.

HOUSE OF PEERS.

Clerk of Parliament.—Sir William Rose.
Clerk-Assistant.—Ralph Disraeli.
Counsel to Chairman of Committee.—J. H. Warner.
Chief Clerk.—E. M. Parratt.
Index Clerk.—B. Birch.
Principal Clerk, Private Committees.—W. H. Haines.
Principal Private Bill Clerk.—B. S. R. Adam.
Clerk of Printed Paper Office.—O. E. Grant.
Principal Judicial Clerk.—A. W, Dubourg.
Clerk of the Journals.—L. Birch.
Clerk attending the Table.—A. Harrison.
Clerk of Public Bills.—H. C. Malkin.
Receiver of Fees and Accountant.—W. A. Malony.
Librarian.—J. H. Pulman.
Examiners for Stand. Ord.—C. Frere, J. H. Robinson.
Gentleman Usher of Black Rod.—Gen. Sir W. Knollys.
Yeoman-Usher.—Colonel R. C. Spencer Clifford.
Sergeant-at-Arms.—Lieut.-Col. Talbot.
Resident Superintendent.—Mr. Scott.
Short-hand Writer.—W. H. Gurney Salter.
Doorkeepers.—Brophey, Holloway, and Goddard.
Superintendent of Refreshment Rooms.—Mr Aggas.
Housekeeper.—Mrs Lovegrove.
Police Inspector.—Mr Butler.

HOUSE OF COMMONS.

Clerk of the House.—Sir T. Erskine May.
,, *Assistant.*—R. Palgrave.
,, *of Public Bills.*—W. Rose.
,, *of Committees.*—C. Eales.
,, *of Journals.*—J. B. Bull.
,, *of Private Bills.*—H. B. Mayne.
Accountant.—W. O. Mayne.
Short-hand Writer.—W. H. Gurney Salter.
Deliverer of Votes.—R. M. Bailey.
Sergeant-at-Arms.—R. A. Gossett.
Deputy Sergeant.—H. D. Erskine.
Assistant-Sergeant.—Colonel Forester.
Doorkeepers.—G. Hartley and J. Jarratt.
Postmaster.—E. W. Pike.
Superintendent of Members' Waiting Room.—H. Cove.
Superintendent of Refreshment Rooms.—Mr Nicholes.
Chaplain to the House.—Rev. F. Byng, M.A.
Secretary to the Speaker.—C. W. Campion.
Counsel to the Speaker.—G. K. Rickards.
Examiners of Private Bills.—C. Frere, J. Robinson.
Taxing Master.—C. Frere.
Librarian.—G. Howard.
Trainbearer to the Speaker.—G. Brown.
Police Inspector.—Mr Denning.

SUMMARY OF THE HOUSES OF PARLIAMENT.

HOUSE OF PEERS.

Peers of the Blood Royal	5
Archbishops	2
Dukes	21
Marquises	19
Earls	115
Viscounts	25
Bishops	24
Barons	248
Scotch Representative Peers	15
Irish Representative Peers	28
Total	502

HOUSE OF COMMONS.

ENGLAND	—40	Counties	172	Members	459
,,	184	Cities, Boroughs, &c.	282	,,	
,,	3	Universities	5	,,	
WALES	—12	Counties	15	,,	30
,,	14	Districts of Boroughs	15	,,	
SCOTLAND	—33	Counties	32	,,	60
,,	22	Cities, Burghs, &c.	26	,,	
,,	4	Universities	2	,,	
IRELAND	—32	Counties	64	,,	103
,,	31	Cities and Boroughs	37	,,	
,,	1	University	2	,,	
				Total	652

Stamps and Taxes.

STAMP DUTIES.

	£	s.	d.
AFFIDAVITS or STATUTORY DECLARATIONS before a magistrate under 5 to 6 Wm. IV. cap. 62	0	2	6
APPRENTICESHIP INDENTURES			
When no premium is paid	0	2	6
In any other case, for every £5 of premium paid	0	5	0
ARTICLES OF CLERKSHIP			
To an attorney or solicitor in England or Wales	80	0	0
To an attorney of the County Palatine of Lancaster, writer to the signet, or solicitor in Scotland	60	0	0

APPRAISEMENT or valuation of any property, or of any interest therein, or of the annual value thereof, or of any dilapidations, or of any repairs wanted, or of the materials and labour used or to be used in any building, or of any artificers' work whatsoever :—

	£	s.	d.
Not exceeding £5	£0	0	3
Exceeding £5 and not exceeding £10	0	0	6
,, 10 ,, 20	0	1	0
,, 20 ,, 30	0	1	6
,, 30 ,, 40	0	2	0
,, 40 ,, 50	0	2	6
,, 50 ,, 100	0	5	0
,, 100 ,, 200	0	10	0
,, 200 ,, 500	1	15	0
,, 500	1	0	0

Exemptions.—Appraisement or valuation made for, and for the information of, one party only, and not being in any manner obligatory as between parties either by agreement or operation of law. Appraisement or valuation made in pursuance of the order of any Court of Admiralty or for the purpose of ascertaining the legacy or succession duty.

AWARD in England or Ireland, and AWARD or DECREET ARBITRAL in Scotland. Where the amount or value of the matter in dispute—

	£	s.	d.
Not exceeding £5	£0	0	3
Exceeding £5 and not exceeding £10	0	0	6
,, 10 ,, 20	0	1	0
,, 20 ,, 30	0	1	6
,, 30 ,, 40	0	2	0
,, 40 ,, 50	0	2	6
,, 50 ,, 100	0	5	0
,, 100 ,, 200	0	10	0
,, 200 ,, 500	0	15	0
,, 500 ,, 750	1	5	0
,, 1,000 ,,	1	15	0

MORTGAGE, BOND, DEBENTURE, COVENANT, WARRANT of ATTORNEY to confess and enter up judgment, and FOREIGN SECURITY of any kind, being the only, or principal, or primary security for the payment or repayment of money—

	£	s.	d.
Not exceeding £25	£0	0	8
Exceeding £25 and not exceeding £50	0	1	3
,, 50 ,, 100	0	2	7
,, 100 ,, 150	0	3	9
,, 150 ,, 200	0	5	0
,, 200 ,, 250	0	6	3
,, 250 ,, 300	0	7	6
For every £100, or fractional part of each £100, exceeding £300	0	2	6

	£	s.	d.
BILL OF LADING of any goods, merchandise, or effects to be exported or carried coastwise	£0	0	6
BOND, or INSTRUMENT to secure any sum of money, not secured by a duly stamped instrument, for every £5	0	2	6
Bond of any kind not specifically charged with duty, and when the amount does not exceed £300, the same *ad valorem* duty as a Bond for a limited amount.			
In any other case	0	10	0
CONVEYANCE, or **TRANSFER**, whether on sale or otherwise—			
Of any stock in the Bank of England, not exceeding £25	0	9	0
Exceeding £25	0	12	0
Of any stock in the East India Company	1	10	0
Of any debenture stock or funded debt of any company or corporation. For every £100, and also for any fractional part of £100, of the nominal amount transferred	0	2	6
On sale of any property (except such stock or debenture stock or funded debt as aforesaid) :—			
Not exceeding £5	0	0	6
Exceeding £5 and not exceeding £10	0	1	0
,, 10 ,, 15	0	1	6
,, 15 ,, 20	0	2	0
,, 20 ,, 25	0	2	6
,, 25 ,, 50	0	5	0
,, 50 ,, 75	0	7	6
,, 75 ,, 100	0	10	0
,, 100 ,, 125	0	12	6
,, 125 ,, 150	0	15	0
,, 150 ,, 175	0	17	6
,, 175 ,, 200	1	0	0
For every £50, and any fractional part of £50 of such amount or value	0	5	0
POWER of ATTORNEY for sole purpose of voting by proxy	0	0	1
By any petty officer, seaman, or marine, or soldier serving, of any such person for receiving prize money or wages	0	1	0
For the receipt of the dividends or interests of any stock—			
Where made for the receipt of one payment only	0	1	0
In any other case	0	5	0
For the receipt of any sum of money, or any bill of exchange or promissory note for any sum of money, not exceeding £20, or any periodical payments not exceeding the annual sum of £10 (not being hereinbefore charged)	0	5	0
For the sale, transfer, or acceptance of any of the Government or Parliamentary stocks or funds—			
Where the value of such stocks or funds does not exceed £20	0	5	0
In any other case	0	10	0
Of any kind not hereinbefore described	0	10	0

Exemptions.—Letters or power of attorney for the receipt of dividends of any definite and certain share of the Government or Parliamentary stocks or funds, producing a yearly dividend of less than £3.

STAMPS AND TAXES

LEASE—For any definite term less than a year :—

Of any dwelling-house or tenement, at a rent not exceeding £10 per annum	£0	0	1
Of any furnished dwelling-house or apartments, where the rent for such term exceeds £25	0	2	6
Of any lands, tenements, or heritable subjects, except or otherwise than as aforesaid, the same duty as a lease for a year at the rent reserved for the definite term.			

For any other term :—

Where the yearly rent or otherwise is at a rate :—	Not exc. 35 years.		Ex. 35 years but not 100.			Exceeding 100 years.		
	s.	d.	£	s.	d.	£	s.	d.
Not exc. £5 per annum	0	6	0	3	0	0	6	0
Ex. £5 and not ex. £10...	1	0	0	6	0	0	12	0
,, 10 ,, 15...	1	6	0	9	0	0	18	0
,, 15 ,, 20...	2	0	0	12	0	1	4	0
,, 20 ,, 25...	2	6	0	15	0	1	10	0
,, 25 ,, 50...	5	0	1	10	0	3	0	0
,, 50 ,, 75...	7	6	2	5	0	4	10	0
,, 75 ,, 100...	10	0	3	0	0	6	0	0
For every full sum of £50 and also for any fractional part of £50 thereof	5	0	1	10	0	3	0	0

Of any other kind whatsoever not hereinbefore described	0	10	0

Note.—The 1d. duty upon small and short lettings may be denoted by an adhesive stamp.

MISCELLANEOUS.—

Grant of arms, or armorial ensigns only, under the sign manual, or by any of the kings-of-arms of England, Scotland, or Ireland	10	0	0
Grant or license, under the sign manual, to take and use a surname and arms, or a surname only. In compliance with the injunction of any will or settlement	50	0	0
Upon any voluntary application	10	0	0
Contract note for the purchase of any stock or marketable security... ...	£0	0	1
Letters of allotment of any company or proposed company, or letter of renunciation	0	0	1
Scrip certificate, or other document ...	0	0	1
Certificate of the registration of a design	5	0	0
Agreement or memorandum made without any clause of registration, whether the same be only evidence of contract, and not otherwise charged with duty...	0	0	6
Agreement or contract made or entered into under the Highway Acts ...	0	0	6
Copy or extract (certified) from any register of births, baptisms, marriages, deaths, or burials	0	0	1

BILLS OF EXCHANGE.

Bill of Exchange, Draft and Promissory Note of any kind, payable on demand or at any other time, for any sum of money :—

Not exceeding £5	£0	0	1
Exceeding £5 and not exceeding £10 ...	0	0	2
,, 10 ,, 25 ...	0	0	3
,, 25 ,, 50 ...	0	0	6
,, 50 ,, 75 ...	0	0	9
,, 75 ,, 100 ...	0	1	0
,, 100 ,, 200 ...	0	2	0

For every additional £100, or fractional part of £100 over the first £100, an additional duty of 1s.

RECEIPTS.

For £2 and upwards... ... ... One Penny.

N.B.—Persons receiving the money are to pay the duty.

Receipts may be stamped within fourteen days of date, on payment of £5, or within one month on payment of £10 penalty; after that time they cannot be stamped.

Penalty for giving a receipt without a stamp	£10
Penalty for not effectually cancelling or obliterating adhesive stamps when used	10
Penalty for frauds in the use of adhesive stamps	20

ASSESSED TAXES.

ARMORIAL BEARINGS.

If such armorial bearings are painted on any carriage	£2	2	0
If not so painted, but shall be otherwise worn or used...	1	1	0

Note.—Armorial bearings means any arms, crest, or ensign worn or used.

INCOME TAX.

From April 1879 to April 1880, all incomes of £150 per annum, and not exceeding £400, are taxed at the rate of 5d. in the £, after allowing a deduction of £120 on incomes of less than £400 :—for example, a man earning £150 will be rated only at £30. Incomes of £400 and upwards are rated at 5d. in the £ without any deduction.

Exemption.—Under a recent Act of Parliament, the premiums paid by a person for an Assurance on his own life, or on the life of his wife, or for a deferred Annuity to his widow, are declared free from Income Tax, provided such premiums do not exceed one-sixth of his income.

DWELLING-HOUSES.

The duty is 6d. in the £ in respect of dwelling-houses of £20 or upwards, occupied by any person in trade who shall expose to sale and sell any goods in any shop or warehouse, being part of the same dwelling-house, and in front and on the ground or basement storey thereof; or by a person licensed to sell herein, by retail, beer, &c.; or as a farmhouse by a tenant, or farm servant, and *bonâ fide* used for the purpose of husbandry only. The duty is 9d. in the £ for dwelling-houses not occupied and used for any of the purposes described in the preceding.

Exemption.—Market-gardens and nursery-grounds are not to be included in valuation of inhabited houses.

LEGACY DUTIES.

To children or their descendants, or lineal ancestors of the deceased ...	£1 0 0
Brother or sister, or their descendants ...	3 0 0
Uncle or aunt, or their descendants ...	5 0 0
Grand uncle or aunt, or their descendants	6 0 0
All other relations or strangers	10 0 0

The husband or wife of the deceased not chargeable. Probates and Letters of Administration are exempt, if the effects are under £100 in value.

CARRIAGES.

For every carriage having four or more wheels, weighing 4 cwt. or upwards	£2 2 0
If less than four wheels, or having four, and weighing less than 4 cwt. ...	0 15 0

MALE SERVANTS.

For every male servant	£0 15 0

HORSES AND HORSE DEALERS.

For every horse dealer	12 10 0

The above duties shall be paid by the person who shall employ the servant, or shall keep the carriage, or horse or mule, or shall exercise or carry on the trade of a horse dealer.

Exemptions.—Horses employed solely in agriculture. The Commissioners have decided, in a case appealed from Coldstream, that a horse unable to work, and turned out to grass, becomes liable to duty. Farmers do not pay the horse-dealers' duty as regards the sale of animals under five years of age stocked on the farm.

DOG LICENSES.

For every dog, of whatever description or denomination	£0 7 6

No exemption, except for dogs under six months old. Persons keeping dogs without a license are liable to a penalty of £5.

GAME LICENSES.

If License or Certificate be taken out after April 5, and before November 1, to expire on April 5 in the following year	£3 0 0
To expire on October 31 in the same year in which the License or Certificate shall be taken out	2 0 0
If License or Certificate be taken out on or after November 1 to expire on April 5 following	2 0 0
To deal in Game	2 0 0

GUN LICENSES.

On and after April 1, 1870, every person using a gun (save those paying game certificates; occupiers of lands, or those in their employ using a gun for scaring birds or killing vermin; persons in the naval, military, volunteer, or constabulary service; gunsmiths or their servants carrying guns for purposes of testing only; common carriers carrying guns in their ordinary business) must take out a 10s. license, under the penalty of £10.

The Post Office.

INLAND LETTERS to any part of the United Kingdom, not exceeding		1 ounce	1d.
Exceeding 1 ounce, but not exceeding		2 ounces	1½d.
,, 2 ounces	,,	4 ,,	2d.
,, 4 ,,	,,	6 ,,	2½d.
,, 6 ,,	,,	8 ,,	3d.
,, 8 ,,	,,	10 ,,	3½d.
,, 10 ,,	,,	12 ,,	4d.

If a letter exceeds 12 oz. it will be charged 1d. per oz., beginning with the first oz.: thus, a letter weighing 12 oz. and not exceeding 13 oz. will be charged 1s. 1d., and so on. No limit exists to the weight of paid letters, but no inland letter must exceed 18 inches in length, 9 inches in width, and 6 in depth. All inland letters must be prepaid in stamps, except letters posted at the Chief Offices in London, Edinburgh, and Dublin, one hour before the closing of the mails, by one individual or firm collectively, postage of which amounts to £2 or upwards.

Unstamped letters are charged double postage on delivery. If coin be enclosed in a letter, the letter will be charged double the fee of an ordinary Registered Letter.

REGISTERED LETTERS.—Inland Letters are charged 2d. Colonial letters, book packets, &c., except those to Ascension, Vancouver, British Columbia, and Labuan, may be registered upon payment in money of a fee of 4d. over and above the postage. Letters only can be registered to certain foreign countries, but in many cases only to the port of despatch. Registered Letters must be posted half-an-hour previous to ordinary letters.

NEWSPAPERS from one Post Town to another within the United Kingdom are charged ½d., with or without supplements. India, *viâ* Southampton, 2d.; Newspapers to the Colonies, 1d.; *viâ* any foreign country, 2d.

BOOK POST.—A Book, or any number of Books or Printed Letters from one Post Town to another, within the United Kingdom, in a cover open at the ends, not exceeding 2 feet in length, and not exceeding 2 oz. in weight, is charged one ½d.; and an additional ½d. for every 2 oz. or fractional part of 2 oz. A Book-packet may contain any number of separate books or other publications (including printed letters and printed matter of every kind); but no written letter is allowed in any case.

The privileges of the Book Post are now extended to the whole of the British Colonies and Settlements. Packets to any part of Cape Colony other than Cape Town, Port Elizabeth, or Mossel Bay, must be addressed to the care of some one at either of these places.

THE SAMPLE POST—since the recent reduction of postage—has been abolished, except to the Colonies, and certain foreign countries.

FOREIGN LETTERS.—For all parts within the Postal Union, 2½d., if not exceeding ½ oz.

MONEY ORDERS are granted and paid in the United Kingdom :—

				s.	d.
For sums under 10s.			...	0	2
,,	of 10s. and under £2			0	3
,,	£2	,,	3	0	4
,,	3	,,	4	0	5
,,	4	,,	5	0	6
,,	5	,,	6	0	7
,,	6	,,	7	0	8
,,	7	,,	8	0	9
,,	8	,,	9	0	10
,,	9	,,	10	0	11
,,	10	,,	...	1	0

No single Order is issued exceeding £10, and sums for fractions of 1d. not allowed. Money Orders are also granted to certain Post Towns in the British Colonies and to many Foreign Countries at an additional charge.

Payment of an Order must be obtained before the end of the second month, exclusive of the month the Order was issued in, or a fresh commission must be paid; under any circumstances an Order will not be paid after twelve clear months. In case of the miscarriage or loss of a Money Order, a duplicate is granted on a written application (with the necessary particulars, and enclosing the amount of a second commission in postage stamps) to the Comptroller of the Money Order Office of the Kingdom where the original Order was issued.

HALFPENNY POSTAGE.—Registered Newspapers, Book Packets, and Post Cards and Circulars (unsealed) may be sent by post between places in the United Kingdom, at the following rates of postage :—

On a registered newspaper, with or without supplement	½d.
On each registered newspaper in a packet of two or more	½d.
On a book packet :—If not exceeding 2 oz. in weight	½d.
If exceeding 2 oz. in weight, for every additional 2 oz. or fractional part of 2 oz.	½d.
On a post card	½d.

Provided that a packet of two or more registered newspapers, with or without a supplement or supplements, shall not be liable under this section to a higher rate of postage than the rate chargeable on a book packet of the same weight.

If any registered or other newspaper, supplement, publication, book-packet, or post card, is sent by post otherwise than in conformity with this Act, or any Treasury warrant, or Post Office regulations, it shall either be returned to the sender thereof, or forwarded to its destination, in either case charged with such rate of postage not exceeding the letter rate of postage, or without any additional charge, as the Postmaster-General, with the approval of the Treasury, from time to time directs, having been, if necessary, detained and opened in the Post Office.

The public are prohibited from using an embossed or impressed stamp separated from a cover or card, although such stamp has not been before sent by post.

TELEGRAPHS.

Telegraphic messages sent from all the principal offices, night and day, at a uniform rate of 1s. for twenty words, exclusive of name and address. Printed forms can be had at all the offices.

POST OFFICE SAVINGS BANK.

By 24 Vic. cap. 14, deposits of 1s., or of any number of shillings, or of pounds and shillings, will be received from any depositor at the Post Office Savings Banks, provided the deposits made by such depositor in any year ending the 31st day of December do not exceed £30, and provided the total amount standing in such depositor's name in the books of the Postmaster-General do not exceed £150, exclusive of interest. When the principal and interest together standing to the credit of any one depositor amount to the sum of £200, all interest will cease, so long as the same funds continue to amount to the said sum at £200. Upon every £ yearly interest is given of the rate of £2 10s. per cent.

The interest is calculated to December 31 in every year, and is then added to, and becomes part of the principal.

THE MILES OF DIFFERENT NATIONS GIVEN IN ENGLISH YARDS.

Arabian mile	2,148
Bohemian mile	10,137
Brabant mile	6,082
Burgundy mile	6,183
Chinese lis	629
Danish mile	8,244
English mile	1,760
English mile, Geo.	2,025
Flemish mile	6,869
French league	4,860
French marine league	6,075
French legal league of 2,000 toises	4,263
German mile, Geo.	8,100
German mile, long	10,126
German mile, short	6,859
Hamburgh mile	8,244
Hanoverian mile	11,559
Dutch mile	6,395
Hungarian mile	9,110
Irish mile	2,240
Italian mile	2,025
Persian parasang	6,086
Polish mile, short	6,071
Polish mile, long	8,130
Portuguese legoas	6,768
Prussian mile	8,462
Roman mile, ancient	1,615
Roman mile, modern	2,027
Russian verst	1,165
Saxon mile	9,904
Scotch mile	1,983
Silesian mile	7,086
Spanish leguas, common	7,415
Spanish leguas, legal	4,636
Swedish mile	11,703
Swiss mile	9,155
Turkish berries	1,826

Central and Associated Chambers of Commerce.

THE CENTRAL CHAMBER.

Chairman.

The Most Hon. the **Marquis of Huntly**, 5 Grosvenor Square, W.

Vice-Chairman.

Col. S. B. **Ruggles Brise**, M.P., Spains Hall, Braintree, Essex.

Treasurer.

Charles Clay, Walton Grange, Wakefield.

Secretary.

Capt. P. G. **Craigie**.

Offices.

21 Arundel Street, Strand, London, W.C.

Elected Members of the Council for 1879.

Ackers, B. St. John, Prinknash Park, Painswick, Gloucestershire.
Arkell, Thomas, Sherborne House, Lechlade.
Caldecott, C. M., Holbrook Grange, Rugby, Warwickshire.
Clay, Charles, Walton Grange, Wakefield, Yorkshire.
Craigie, Captain, P. G., Hartley House, Lower Heath, Hampstead, N.W.
Duckham, Thomas, Baysham Court, Ross, Herefordshire.
Fortescue, Earl, Castle Hill, South Molton, Devonshire.
Fowler, J. K., Prebendal Farms, Aylesbury, Bucks.
Howard, James, Clapham Park, Bedfordshire.
Jones, J. Bowen, Ensdon House, Montford Bridge, R.S.O., Shropshire.
Little, William C., Stag's Holt, March, Cambridgeshire.
Longs Daniel, Whaddon, Gloucestershire.
Masfen, R. H. Pendeford, Wolverhampton, Staffordshire.
Muntz, G. F., Umberslade Hall, near Birmingham, Warwickshire.
Neild, Henry, The Grange, Worsley, Manchester.
Pell, Albert, M.P., Hazlebeach Hall, Northampton.
Phipps, Pickering, M.P., Collingtree Grange, Northampton.
Read, Clare Sewell, M.P., Honingham Thorpe, Norwich.
Smythies, George, Marlow Lodge, Leintwardine, Herefordshire.
Storer, George, M.P., Thoroton Hall, Bingham, Nottinghamshire.
Trask, John, Northington, Alresford, Hampshire.
Turner, Jabez, Norman Cross, Peterborough, Huntingdonshire.
Whitaker-Wilson, G., Caldewell, Kempsey, Worcester.
Willson, Thomas, Knaptoft House, Oundle, Northamptonshire.

ASSOCIATED CHAMBERS.

Chamber.	Secretary.
Banbury District	W. T. Warner, Copredy, Leamington.
Bedale.........................	J. Teale, Solicitor, Bedale.
Brecknockshire	Rhys Davies, 8 Lion Street, Brecon.
Buckinghamshire	Geo. Fell, Aylesbury.
Cambridgeshire and Isle of Ely	R. Peters, jun., 30 Bridge Street, Cambridge.
Cheshire	Thomas Rigby, Winsford, Cheshire.
North Cheshire............	Jno. F. May, solicitor, Macclesfield.
Cirencester..................	Robert Ellett, Public Office, Cirencester.
Cornwall County	Henry Tresawna, Lamellyn, Probus.
Cowbridge Farmers' Club	G. E. Tutton, Llantrithryd, Cowbridge.
Croydon Farmers' Club	J. S. Streeter, 104 High Street, Croydon.
Devon and Cornwall.....	J. B. Body, Old Town-chambers, Plymouth.
Devonshire..................	B. J. Ford, solicitor, Exeter.
Dorsetshire..................	Rd. Genge, Waterson, Dorset.
South Durham and North Yorkshire	C. Waistell, Northallerton.
Essex	E. H. Bentall, Elm Villa, Halstead.
Gloucestershire	A. C. Wheeler, Gloucester.
Hampshire..................	Henry Downs, Basingstoke.
Herefordshire	J. P. Brown, 5 East Street, Hereford.
Hertfordshire...............	V. Austin, Hertford.
Howdenshire	Henry Green, solicitor, Howden.
East Kent	George Slater, land agent, Canterbury.
Maidstone Farmers' Club and Chamber of Agriculture......................	W. H. Gibbons, 10 Medway Terrace, Maidstone.
Lancashire	Thos. Rigby, Durnhall Mill Farm, Winsford.
Leicestershire...............	Thomas Wilson, Knaptoft House, Oundle.
Lincolnshire	Stephen Upton, St. Benedict's Square, Lincoln.
Monmouthshire............	J. S. Stone, Dock Street, Newport.
Newcastle Farmers' Club	T. Bell, Hedley Hall, Marley Hill, Gateshead.
Newbury.....................	Geo. J. Cosburn, Mercury Office, Newbury.
Norfolk	G. C. Grimmer, Opie Street, Norwich.
Northamptonshire	Tho. J. Adkins, Booth Farm, Northampton.
Nottinghamshire	Edwin Browne, Imperial Buildings, Nottingham.
Penrith Farmers' Club	Thomas Robinson, Eamont Bridge, Penrith.
Peterborough District ...	F. G. Buckle, Savings Bank, Peterborough.
Ripon	Geo. Tutin, solicitor, Ripon.
Scottish	David Curror, India Buildings, Edinburgh.
Shropshire	Alfred Mansell, 26 Market Street, Shrewsbury.
Somersetshire	Messrs Mayo and March, Yeovil.
Staffordshire	W. Tomkinson, Newcastle, Staffordshire.
East Suffolk	R. L. Everett, Rushmere, Ipswich.
West Suffolk	G. Blencowe, Whiting Street, Bury St. Edmunds.
Sunderland	J. T. Lawson, Hollycarr House, Tunstall.
Swindon......................	J. H. Piper, 13 Bath Road, Swindon, Wilts.
Warwickshire	Hugh Suffolk, King's Head Chambers, Coventry.
Wisbeach District.........	Geo. J. Moore, The Limes, Elm, Wisbeach.
South Wilts	J. Marsh, jun., Devizes.
Worcestershire	John Blink, solicitor, Droitwich.
East Riding of Yorkshire	Tom Turner, solicitor, Newbegin, Beverley.
West Riding of Yorkshire	Matthew B. Hicks, Exchange Buildings, Wakefield.
Wakefield Branch	
Doncaster Branch	
York	H. F. Cundall, 40 Coney Street, York.

Monthly Work in the Garden.

JANUARY.

More than half of the success of gardening springs from doing everything at the right time. The other half comes of doing things in a proper manner, and placing things in the best places. In our instructions we shall endeavour to keep these all in mind; and if our readers will do likewise, we trust their gardens will not only prosper, but that the work in them will constitute one of their chief delights. In assessing the value of gardens, the many hours of happiness and healthful recreation they bring are too often left out of the account. These, however, are of far more value to many than all else. Fresh-grown vegetables, clean, tender, and crisp; fruit, luscious and sweet; and flowers grown at home, fragrant and beautiful, are boons of the highest order; but the thought, the labour, and the love bestowed upon them exceed and transcend all. To this labour we must lead you.

Kitchen Garden.

Trench and manure borders for early crops. Sow early frame Peas, preferring the white Warwick variety and Early Charlton in the beginning of the month, and Knight's Dwarf Early Marrowfat about the end of the month; Marshall's Early Dwarf, Early Mazagan, and Longpod Beans during the first and last weeks; a few Onions, Early Horn Carrots, and Round-leaved Spinach for early crops, on very light soils; as also Curled Parsley, if not done in August, on a warm border; short-topped Radish in two or three sowings, at a week's interval, in the same situation. In the last fortnight, sow Hardy Green and Brown Dutch Lettuce.

Plant fruit trees in general in open weather, mulching the trees to protect them from the drought which may occur in spring. Plant Shallot and Garlic.

Prune all sorts of fruit trees in mild weather or in moderate frosts, nailing only in fine weather; wash those trees infested with insects with a mixture of soapsuds, flowers of sulphur, and Tobacco liquor.

Forcing Department.

About the end of the month prepare for making up hotbeds for early Cucumbers and Melons, at least where a pit heated with hot water is not in use. Sow salads, Carrots, and Kidney Beans on slight hotbeds. Sow Peas in cold frames for transplanting. Force Asparagus, Seakale, and Rhubarb in hotbeds, in pits, in the Mushroom house, or in the open garden by covers surrounded with litter. Give air in fine weather, and water sparingly, to the Pinery and Cucumber pit; and to other forcing houses, according to the progress of the trees. Attend to forced Kidney Beans and Strawberries. Give abundance of air to the greenhouse, conservatory, and Alpine frame, but little water. Continue to force Roses, Kalmias, Rhododendrons, and hardy flowers and bulbs for the decoration of the greenhouse, or to be taken into the lobby or the drawing-room. Most of these ought to be potted and prepared in autumn.

Flower Garden.

Plant dried tubers and bulbs of border flowers, if not done in autumn; but the planting of the roots of the finer florists' flowers ought to be deferred till next month.

Transplant herbaceous plants and evergreen shrubs in light soils, if not done in autumn; also deciduous trees, shrubs, and hedges. Lay edgings in fine weather.

Sow Mignonette, Stocks, and other annuals in pots; sow Sweet Peas, and a few hardy annuals, on a warm border. Give Stage Auriculas and Carnations abundance of air; but keep them rather dry, to prevent damping off.

FEBRUARY.

Kitchen Garden.

Continue to trench and manure the quarters for early crops. Sow Beans and Peas in the beginning and also at the end of the month; a few early Cabbages, to replace the last sowing in August; Red Cabbages and Savoys in the last week. Sow also Early Horn Carrot, Dutch Turnip, Onions for a full crop in light soils, with a few Scotch Leeks. Sow Chervil, Fennel, and Lettuce for succession, with Radishes and Round-leaved Spinach, twice in the course of the month; small salads every fortnight.

Plant Jerusalem Artichokes, Garlic, Horse-radish, and Early Potatoes; in the last week, a full crop of early Cabbages on light soil. All sorts of fruit trees may still be planted; Strawberries about the end of the month. Transplant for seed, if not done before, all the Brassica tribe, including Cabbage, Cauliflower, Turnip, &c.; also Carrots, Onions, Beet, Celery, Endive, Leeks, and Parsnips. Transplant to the bottom of the south-aspected wall a few of the Peas sown in November for the first crop.

Prune Apricots, Peaches, Nectarines, and Plums before the buds be much swelled; also Apples, Pears, Cherries, Gooseberries, Currants, and Raspberries before the end of the month. Finish the dressing of Vines. Keep the fruit-room free from soiled fruit, and shut it close, admitting as little air as possible.

Forcing Department.

Plant out Melons and Cucumbers on hotbeds and in pits, sowing more for succession. Sow Carrots, Turnips, and early Celery; Cauliflower to be afterwards planted out. Sow New Zealand Spinach in pots. Plant early Potatoes on slight hotbeds. Continue the forcing of Asparagus, Rhubarb, and Seakale. Pine Apple plants require little air or water at this season, except young plants in dung-frames, which ought to be kept free from damp. Shift fruiting plants by the middle of the month, if not done in August. Continue the forcing of all sorts of fruits. Those who have not commenced sooner, and who have a small establishment, will find the middle or end of this month a good season to begin the forcing of Vines or Peaches. Be careful to protect the stems of Vines that are outside of the forcing houses.

Let the greenhouse and conservatory have plenty of air in mild weather. Put in an extra quantity, if not done in autumn, of cuttings of desirable half-hardy greenhouse genera for the flower garden, such as Pelargonium, Fuchsia, Salpiglossis, Calceolaria, Heliotropium, Salvia, Verbena, Petunia, Alonsoa, Mimulus, Lobelia, Maurandya, Tropæolum, Bouvardia, Rodochiton, Leptospermum, Anagallis. Many species and varieties of such genera are of great beauty, and contribute most essentially to the rich appearance of the flower garden during the summer and autumn months. Sow Stocks, a few tender annuals, and Dahlia seed on a slight hotbed or in pots.

Flower Garden.

In good weather, plant dried roots, including most of the finer florists' flowers. Continue the transplanting of hardy biennial flowers, and perennial herbaceous plants, shrubs, and deciduous trees.

Sow in the last week Mignonette, and several species of hardy annuals, in a warm border for subsequent transplanting—particularly Clarkia, Collinsia, Collomia, Eutoca, Gilia, Limnanthes, Nemophila, and Œnothera.

MARCH.

Kitchen Garden.

Main crops of Peas, Beans, Cabbages, and Onions, Leeks, Carrots, Parsnips, Brussels Sprouts, Borecoles, Lettuces, and Spinach are now to be sown. At the end of the month, sow Turnips and Savoys. In the last fortnight, sow Asparagus, Cauliflower, Seakale, Couve tronchunda, Cardoons, Celery, and most of the culinary aromatics, as Dill, Fennel, Parsley. Small salads should be sown every ten days.

Plant early Potatoes in the first week, and a main crop during the last fortnight. Strawberries, Jerusalem Artichoke, Seakale, Asparagus, and Peas raised in frames may now be planted out. Full crops of Cabbages should also be planted out. Propagate by slips the various pot-herbs.

Fruit Garden.

Finish the planting and pruning of fruit trees before the middle of the month. Protect those coming into blossom with the various coverings usually employed, or by giving a little heat to flued walls. Begin grafting in the third week. Kill wasps when they first appear, for the death of every individual at this period is equal to the destruction of a colony in autumn.

Forcing Garden.

Proceed with the forcing of Melons and Cucumbers, giving air, and applying linings to maintain the proper temperature. Examine Pine Apple suckers and crowns, potting those that have been kept in tan during the winter; re-potting those that require larger pots, and dressing the roots of such as are sickly; about the middle of the month shift to the succession pit, and give a top-dressing to the fruiting plants: turn the tan, and add new bark to the pits, to keep up bottom-heat. In the Vinery and Peach house attend to the keeping down of insects by watering; and promote the growth of the young shoots by steaming in the evenings. Graft Vines when the shoots are sprung about 15 inches. Sow seeds of Capsicum and Tomato; also tender annuals for the stove. Sow salads, Early Horn Carrot, and early Dutch Turnip on slight hotbeds during the first fortnight; as also Celery and Cauliflower for transplanting. Force Strawberries and Kidney Beans, and hardy flowers and bulbs.

Greenhouse.

More water may be given than formerly. Sow seeds of greenhouse and hothouse plants; also the different sorts of tender annuals; pot off those sown last month. Shift greenhouse and stove plants; plant Tuberoses in pots for forcing; remove the forced shrubs and plants as they come into flower from the forcing houses to the conservatory; attend to the Alpine and Auricula frames. Begin to propagate greenhouse and stove plants by cuttings.

Flower Garden and Shrubbery.

In the last week sow hardy annuals in the borders, with biennials that flower the first season; as also perennials. Plant Anemone and Ranunculus roots. Transplant from the nursery to their final sites annuals sown in autumn, with biennials and perennial herbaceous plants. Propagate perennials from root-slips and offsets. Protect Tulips, Hyacinths, and choice flowers from severe weather. In the last week put into heat the finer sorts of Dahlias, so as to start them and prepare them for propagation by cuttings and by division of the roots. In the first week complete the planting of hardy deciduous trees and shrubs; and finish the planting of Evergreens by the middle; but some of the hardier sorts may still be planted towards the end of the month.

APRIL.

Kitchen Garden.

Sow main crops of Asparagus, Seakale, Beet, Salsify, Scorzonera, Skirret, Carrots, and Onions on heavy soils; also Peas, Beans, Turnips, Spinach, Celery, Cabbages, Savoys, and German Greens for succession. Sow Broccoli and Kidney Beans both in the second and in the last week; Cardoons not before the end of the month. Small salads should be sown twice or thrice during the month.

Plant Cauliflower, Cabbages, Artichokes, Seakale, Lettuce; and finish the planting of the main crops of Potatoes; and also of Strawberries. Propagate all sorts of pot herbs, and sweet herbs, such as Lavender, Marjoram, Hyssop, Balm, and Pennyroyal. Attend to the hoeing and thinning of Spinach, Onions, Turnips, and Carrots. Earth up Cabbages, Cauliflower, Peas, Beans, and early Potatoes. Stake up Peas: blanch Seakale and Rhubarb.

Fruit Trees.

No pruning or planting ought to be left unfinished till this period; stone fruits, in particular, are much injured by spring pruning. If Vines have been neglected, rubbing off the buds that are not wanted is now safer than pruning.

Forcing.

Continue the preparation of succession beds and pits for Cucumbers and Melons. Attend particularly to the cultivation of those in operation. Sow Gourds and Basil. Pot Tomatoes and Capsicums. Attend to the routine culture of the Pinery, giving water and air when necessary, keeping up the bottom-heat with linings and additions of new tan. In forcing-houses, from the variable state of the weather, considerable vigilance is required in giving air. Keep down red spider (Acarus) in the more advanced houses, by frequent syringings. Continue the usual operations of disbudding and thinning of fruit, and take care to keep up the proper temperature.

Greenhouse, &c.

Little artificial heat will be required except in frosty weather. An abundant supply of air and moisture is now necessary. The glass should be kept off the Alpine frames, except in frosty nights. Attend to the protection of Stage Auriculas from frost, as the flower buds are easily injured. Sow all sorts of tender annuals. Proceed with all necessary shiftings in the greenhouse and stove. Remove Camellias, when the flowers are over, to the stove or forcing houses, as they require heat to make them form healthy shoots and flower buds for next season. Propagate Chrysanthemums by dividing the roots, and all sorts of rare and fine plants, but cuttings or by grafting. Pot off tender annuals and cuttings of half-hardy greenhouse plants, which were put in to strike in the autumn or in February, for the use of the flower borders.

Flower Garden and Shrubbery.

Sow main or succession crops of annuals of all sorts; half-hardy annuals in warm borders, or on slight hotbeds. Biennials and perennials should be sown before the middle of the month. Plant Tigridia pavonia and fine stocks. Finish the transplanting of herbaceous perennials by the end of the first week. Protect Stage Auriculas and Hyacinths from extremes of every description of weather, and Tulips from hoar frosts and heavy rains. Plant out tender deciduous trees and shrubs raised in pots. Remove part of the coverings of all tender shrubs and plants in the first week, and the remainder at the end of the month.

MAY.

Kitchen Garden.

Sow small salads every week; Radishes and Lettuces thrice during the month; Spinach once a fortnight; Carrots and Onions for late drawing; Kidney Beans in the first week and last fortnight; Peas and Beans, Cabbages, Brussels Sprouts, Borecole, Broccoli, Savoys, and German Greens for late crops. The last sowing of Cauliflower for the season should be about the 20th. Cardoons may be sown from the middle to the end of the month. Sow Pumpkins and Cucumbers on a warm border in the last week. Continue the various operations of hoeing and earthing-up the different crops.

Fruit Trees.

Disbud Peaches, Nectarines, and other early trees against the walls; also attend to the thinning of fruit. Give occasional washings with the engine to keep down insects. A little brown or Scotch snuff dusted over the trees after watering will effectually destroy greenfly. Pick caterpillars from Gooseberries and wall trees on their first appearance. Mulch, if not done before, all newly-planted fruit trees, watering abundantly in dry weather. Remove from Raspberries and Strawberries all suckers and runners that are not wanted.

Forcing.

Attend to the cultivation of the Melon and the Cucumber frames, regulating the air, heat, moisture, and shade according to the state of the plants; keeping them free from insects; thinning and training the vines; also renewing the dung-linings when necessary. Plant Pumpkins and pickling Cucumbers, under hand-glasses, on dung-ridges, or in those frames that were used for early vegetables, most of which will be cleared off by the third or last week.

Greenhouse, &c.

Turn out hardy plants about the middle, and tender at the latter end, of the month. Sow tender annuals for succession, potting those sown at an earlier period, and removing them from the frames to the greenhouse or conservatory as they come into flower. Continue to propagate, by cuttings, the different kinds of plants that are now fit for that purpose, potting off such as are rooted. Remove Stage Auriculas to their summer quarters, in some shady place with a north exposure. The Alpine frame will require little more than a good supply of water, with occasional shiftings, and propagating a few of the early-flowering plants. Sow some hardy annuals, and Ten-week Stocks for late flowering.

Flower Garden.

Sow annuals for succession, biennials in the last week, in the nursery compartment, for planting out next year. Propagate by cuttings Dahlias, Pansies, Double Wallflowers, Rockets, Scarlet Lychnis, and Lobelias by dividing the roots. Plant out, during the first week, Dahlias, hardy Pelargoniums, Stocks, Calceolarias, and half-hardy annuals, protecting them from slight frosts. Protect Tulips from the mid-day sun, from rain, and winds. Remove the coverings from all tender plants in the open air, tying up plants where necessary.

Shrubbery.

Planting out of tender Evergreens from pots may be continued; but any other kind of transplanting will be carried on at considerable risk, except in very moist and cloudy weather. Proceed with the laying down of lawns and gravel walks, keeping the grass short.

JUNE.

Kitchen Garden.

Sow Peas and Beans for late crops. The kinds used for early crops are likewise best for this purpose. Sow salading every ten days, also Carrots and Onions for drawing young. In the beginning of the month sow Endive for an early crop. In the first week sow Cardoons and Turnips for succession; and in the third week for a full autumn crop. Sow Scarlet and White Runners for a late crop; and in the middle of the month early Cabbages.

Plant full crops of Broccoli, Brussels Sprouts, Savoys, German Greens, and Leeks; ridge out early Celery, and successional crops of Cabbage and Cauliflower. In the first fortnight of the month plant out Cucumber plants in a warm border, placing hand-glasses over them; these will afford small Cucumbers for pickling. Draw and store winter Onions.

Fruit Trees.

Mulch and water fruit trees and Strawberries in dry weather, desisting from watering as soon as the fruit begins to ripen. Net over Cherry trees, to protect the fruit from birds. Destroy insects by frequent washings, and directing Tobacco-smoke against them, or by strewing snuff (the fine powder of Tobacco) over them. In the first week, plant out Tomatoes in vacant spaces along the bottom of a south wall.

Forcing.

Proceed with planting Melons and Cucumbers raised from seeds and cuttings, for late crops. Keep up, by linings, the necessary temperature for ripening of the fruit. Continue the cultivation of the Pinery stated for last month; but if you wish very large-sized fruit, and do not care about preserving suckers, remove the whole suckers from the stems and roots, and apply heat and water in abundance. Shift suckers and succession plants in the beginning and middle of the month.

Vines, Peaches, &c., may have the same treatment as stated last month. Little water and a good deal of air must be given to those houses where the fruit is beginning to ripen. Those in which the fruit is past ought to be constantly under a system of thorough ventilation.

The greenhouse will now be occupied with tender greenhouse plants and annuals, and the more hardy plants from the stove, for here these last will remain longer in flower. Shift, re-pot, and propagate all fine plants, perennials, biennials, or annuals, and cuttings of all sorts that are desirable. Sow fragrant and showy annuals, to flower in pots during winter.

Flower Garden.

Carefully take up bulbs and tuberous roots, and dry them in the shade before you remove them to the storeroom. .Fill up with annuals and greenhouse plants those beds from which the bulbs and roots have been raised. After this season, keep always a reserve of annuals in pots, or planted on beds or thin layers of well-rotted hotbed dung, from which they are easily removed with balls, to fill up any blanks which may occur in the borders or parterre. Sow perennials, if neglected last month, to be planted out in spring. Lay and pipe Carnations and Pinks in the end of the month. Pay particular attention to the staking and tying up of every plant that requires it, especially young Dahlias, as they are easily destroyed by high winds; in dry weather water abundantly, as many plants are much improved by it, especially Dahlias. Attend to the dressing and cleaning of borders and walks, and the mowing of grass lawns.

JULY.

Kitchen Garden.

This is often a dry month, and one of the first needs of growing vegetables—water—must be provided in such plenty as thoroughly to saturate the earth. Celery, Peas, Asparagus, Cauliflower, Cabbage, Broccoli, Turnips, Lettuces, can hardly make way against a July sun without such copious waterings; or, if they do, they will prove stringy, tough, and worthless. Nine-tenths of most vegetables are sheer water, and water they must have. With water in plenty, July vegetables are as good as any; without, they are often not worth eating.

Sow Peas weekly till after the middle of the month, when the last crop for the season may be put in. In the last week, sow Yellow Turnip for a full winter crop, and Spinach for an early winter crop; Endive, for autumn and winter crops in the beginning and end of the month; also successional crops of Lettuce and small salads. Early Cabbages for Coleworts should be sown in the first week.

Plant full crops of Celery and Celeriac about the middle and end of the month; late crops of Broccoli, Cauliflower, and Coleworts in the last week. Gather and dry medical and pot herbs; also propagate such by slips and cuttings.

Fruit Trees.

Continue the summer pruning and training of all wall and espalier-rail trees, with the destruction of insects. All heavy or over-abundant crops of fruit ought to be thinned, as otherwise not only are the size and quality of the fruit deteriorated, but the trees exhausted and injured. Plant Strawberries in pots, for forcing next winter. Propagate different sorts of fine fruit trees by budding on other trees, or on prepared stocks.

Forcing.

Attend to the pruning of Melons and Cucumbers, giving air and water, renewing linings, &c. Go on with the usual cultivation of the Pinery, but withhold water from the plants when the fruit begins to ripen. Have the old plants with suckers on them put into a brisk bottom-heat, giving proper supplies of water; this will increase their size very much, and materially shorten the period of their coming into fruit. The forcing houses ought to have the same treatment as stated for last month.

Greenhouse.

Little alteration will take place in the culture and management from that given for last month, necessary attention being paid to potting, shifting, and putting in cuttings, and giving abundance of water to the potted plants, both in the house and out-of-doors.

Flower Garden and Shrubbery.

Take up the remainder of the tuberous roots, such as Anemones and Ranunculus, finishing by the end of the first week: fill up their places, and any vacancies that may have occurred, with annuals from the reserve ground. Propagate all the finer herbaceous plants that have gone out of flower by means of cuttings and slips; also select Roses and American Shrubs by layering, budding, or cuttings. Go on with the laying, piping, and striking of Carnations, Pinks, Pansies, and the different varieties of sub-perennial plants, as Sweet William, Pink, Catchfly, Double Rocket, and Double Wallflower, in hand-glasses, or in shaded situations. Attend to the staking and tying up of Dahlias and strong herbaceous plants. Great attention must now be paid to cleaning in every department, weeds springing up after every shower.

AUGUST.

Kitchen Garden.

Sow Winter and Spring Spinach in the beginning and about the middle of the month; Parsley and Winter Onions, for a full crop, in the first week; Cabbages, Cauliflower, Savoys, and German Greens about the middle of the month, for planting out in spring; Lettuce in the first and last week; small salads occasionally; Black Spanish, Red and White Radish, for winter crops.

All winter vegetables, such as Broccoli, Kale, Sprouts, Savoys, and Summer Cauliflower, and Walcheren Broccoli, must be well attended to and liberally treated. Manure-watering, surface-scarifying with the hoe, earthing up, and the complete destruction of all weeds, are the chief cultural attentions needed by such stuff during the month. Leeks, Lettuces, and Endive will grow fast and crisp under the same general treatment.

Plant and earth up Celery and Endive. Plant Strawberries. A few Coleworts may still be put in.

Fruit Garden.

Proceed in the training and regulation of summer shoots of all fruit trees, as directed for the last three months. Attend to the thinning of the fruit where necessary. Mat up, in dry weather, Gooseberry and Currant bushes, to preserve the fruit till late in the autumn. Every exertion must now be used by the gardeners to preserve the ripening fruit on the walls from insects, and to destroy wasp nests.

Forcing.

The same routine of cultivation in hotbeds and pits may be proceeded in as stated for last month. Sow and propagate by cuttings, in the beginning of the month, Cucumbers, to be afterwards grown in hot-water pits, or in boxes in the front of the Pine stove, for a winter crop. In the Pinery, most of the fruit will be cut by the middle of the month, when a general shifting of succession plants should take place, as also a potting of suckers; but these will be strengthened by being allowed to remain on the old plants until the end of this month. In the forcing houses, where the crops are past, part of the sashes may be removed, so as to permit thorough ventilation.

Greenhouse.

Attend to the propagation of all sorts of greenhouse plants by cuttings, and to the replacing in the greenhouse and stoves the more tender species, by the end of the month in ordinary seasons, but in wet weather in the second week. Sow half-hardy annuals, as Clarkia, Schizanthus, Coreopsis, &c., to flower during winter. Also begin to propagate the various species of the half-hardy greenhouse plants, noticed under February, for decorating the flower garden in the following summer.

Flower Garden and Shrubbery.

Sow in the second and the last week, on a warm border of a light sandy soil, with an east aspect, for planting out in spring, Clarkia pulchella, pulchella alba, Gilia capitata, Collomia coccinea, Coreopsis tinctoria, Œnothera Lindleyana, roseo-alba, Romanzovii, Collinsia verna, grandiflora, bicolor, Eutoca viscida, Leptosiphon densiflorus, Nemophila insignis, Eschscholtzia californica, &c. Sow Auricula and Primula seeds in pots and boxes. Propagate all sorts of herbaceous plants by rooted slips; lay Chrysanthemums; in the first week take off layers of Carnations, Pinks, and Pansies. Transplant Evergreens in moist weather, about the end of the month, and propagate them by layers and cuttings.

SEPTEMBER.

Kitchen Garden.

Sow a few small salads for late crops; Lettuce, Parsley, and Spinach, if not done last month, for spring crops. Plant Endive and Lettuce. If Broccoli be too strong or tall to withstand the winter, lift them and lay them nearly up to the neck in the earth. Lift Onions, and lay them out to win on a dry border or gravel walk. Lift Potatoes and store them.

Forcing.

Take care that late crops of Melons and Cucumbers be not injured by damping—from getting too much water and too little air. In the Pinery, the usual routine of cultivation may be carried on; in the first week take off and pot all strong suckers, if not done in the middle of last month; the remainder may be taken off at the end of the month, and planted in old tan in a frame or pit prepared for that purpose; in this way they will be found to keep much better over the winter, and to be better supplied with roots than if they had been potted, which ought never to be done after this season. Expel damp, and assist the ripening of late crops of Grapes and Peaches with fires during the day. Prune early Grape Vines and Peaches.

Greenhouse, Conservatory, &c.

All repairs of painting or glazing ought to be finished by the first week, as many plants will require to be taken into the houses by the 20th of the month. In ordinary seasons, comparatively few greenhouse plants can be trusted in the open air after this period. Pelargoniums and half-hardy greenhouse plants may be kept in frames or in sheltered situations until the end of October. Pot Hyacinths, Polyanthus, Narcissus, and Tulips for forcing. The same attention must be given to the propagation of half-hardy greenhouse plants (see February) as directed for last month. Remove Stage Auriculas to the winter frames about the middle of the month; also tender Alpine plants, keeping the glass frames shut in wet weather. Early in this month replace in the stove all succulents that may have been kept in the greenhouse or in the open air during the summer months.

Fruit Trees, &c.

Finish the summer pruning and training. Assist the maturing of the fruit, and, what is equally important, the ripening of the young wood for next year, of Peaches and Nectarines on hot walls, with fires during the day. Gather and lay up in the fruit-room, with care, the autumnal sorts of Apples and Pears. In the first week plant Strawberries for a main crop next season.

Flower Garden, &c.

Sow in the beginning of this month all half-hardy annuals stated for last month, if not done at that time. Sow also the different species of Primula, and the seeds of all such plants, for, if sown in spring, they seldom come up in the same season, but if sown in September or October they vegetate readily in the succeeding spring. Continue the propagation of herbaceous plants, taking off the layers of Carnations, Pinks, and Pansies, and putting them into a nursery-bed for the winter. Pot Chrysanthemum layers by the end of the month. Keep all Dahlias and tall herbaceous plants properly staked and tied up, as they are very liable to be broken by high winds at this season. The same attention must be given to the cleaning and dressing of this department as directed for the former months. Plant evergreens; make layers, and put in cuttings of most of the hard-wooded sorts of shrubby plants about the middle and end of the month.

OCTOBER.

Kitchen Garden.

Sow small salads and Radishes in the first week; Mazagan and Marshall's Dwarf Beans and early frame Peas (Warwick variety) in the last week. If the winter prove mild they will be somewhat earlier than those sown next month or in January. Prepare and make up Mushroom beds.

Plant early Cabbages in close rows for spring use. A bed of Cauliflowers in the last week, to receive the protection of a three-light frame; or, at any rate, plant Cauliflower at the bottom of a high wall or edge in a sheltered condition. Earth up Celery and Cardoons.

Store Potatoes, Beet, Salsify, Scorzonera, Skirret, Carrots, Parsnips, by the end of the month.

Hoe and thin Winter Spinach and late Turnips. Destroy weeds, which grow very fast during this month.

Fruit Garden.

Such fruit trees as have dropped their leaves may be transplanted. Protect Fig trees, if the weather prove frosty, as soon as they have cast their leaves. Cover late crops of Grapes on hot walls with woollen nets or mats, to prevent injury from frost. Store and lay up very carefully during the month all sorts of Apples and Pears, the longest-keeping sorts not before the end of the month, if the weather is mild; a part of them may be placed in a close cellar.

Forcing.

Assist hotbeds and pits with fresh linings, to keep up the declining heat of such as have not ripened their crops. Late Vineries and Peach houses will still require the application of fire-heat to ripen the wood; for if this be not accomplished, the next crop will be inferior both in quantity and quality. Give abundance of air to the Pinery in good weather, gradually lowering the heat. Prune and dress early Vines and Peaches; clean and repair the forcing houses and their flues; continue the preparation and formation of Mushroom beds.

Greenhouse.

Replace all sorts of greenhouse plants at an early period, as many of them are often much injured by cold rains and frosty mornings at this season. Fill the pits with pots of Stocks, Mignonette, and hardy annuals for planting out in spring, along with many of the more hardy sorts of greenhouse plants. The whole ought to be thoroughly ventilated, except in frosty weather. Water sparingly. Begin to force Roses, Hyacinths, and a few other bulbs for winter and early spring decoration.

Flower Garden.

Sow a few sorts of hardy annuals in a frame, or on a sheltered border, for spring use, as directed for August.

Plant the greater part of the common border bulbs about the end of the month, with a few Anemones for early flowering. Transplant strong plants of biennials and perennials to their final situation.

Protect Alpine plants, Stage Auriculas, and Carnations with glass frames; half-hardy greenhouse plants, such as Fuchsias, &c., about the end of the month, with coverings of Broom or Spruce Fir, preferring the latter. Take up, dry, and store Dahlias and Tigridia tubers in the end of the month; pot Lobelias from the open borders.

Transplant all sorts of hardy Evergreens and shrubs, noticing in dry soils to give abundance of water. Put in cuttings of all sorts of Evergreens. Attend to the removal of decayed plants, leaves, and rubbish from the walks and borders.

NOVEMBER.

Kitchen Garden.

The great business of the month is with the soil. As early as possible, every vacant space of ground should be trenched or dug up. The surface should be left as rough and lumpy as possible. Simply invert the earth, and by no means smash it with the spade after it is turned over. In summer digging, the usual practice is to bang, cut, or drive the upturned earth into fineness. All this must be carefully avoided now. Even the spadeful of earth must be turned gently, for fear of breaking it down in the process. There is a twofold reason for all this care—to expose as much surface to the air as possible, and prolong the season of roughness to the utmost limits. If soil be broken fine when inverted in winter, it soon consolidates into hardness. Snows and rains batter it down, and it might almost as well have been unturned. But left rough, every rain-drop pierces, every sunbeam warms, every fog and dew nourishes it; and it is gradually mellowed by natural forces into the finest tilth.

This is a good time to apply manures. If the manure cannot be got on before the rain has made the ground sticky, the wheeling must be deferred till the frost sets in.

It is likewise a good time for draining gardens. No garden should have stagnant water within 5 feet of the surface.

Sow early frame Peas and Mazagan Beans, for an early crop. Protect Endive, Celery, Artichoke, Seakale, with stable-litter or Ferns; mulch Asparagus with hotbed dung; take up Endive, late Cauliflower, early Broccoli, and Lettuces, and lay them in an open shed, or in old Cucumber and Melon pits, which will protect them from frost, and afford a supply during winter.

Fruit Garden.

Plant all sorts of fruit trees in fine weather, giving an abundant supply of water to settle the earth about the roots. Commence and carry on the various operations of pruning and nailing.

Forcing.

In hotbeds and pits keep up the requisite degree of heat by frequent additions to the linings. Cucumbers and Pines, on hotbeds, will require more than ordinary attention, to prevent them damping off from too much moisture. Where hot-water pipes are employed for heating the necessary temperature and dryness are much more under the control of the gardener. Force Asparagus, Rhubarb, and Seakale in the Mushroom house or pits for a supply at Christmas. Attend to the forcing of Mushrooms. In the forcing houses prune and train the trees; dig and dress the borders of those houses in which this operation has not already been done.

Greenhouse, &c.

All hardy greenhouse plants must now be properly protected, by being replaced in the greenhouse or in pits. Give abundance of air in fresh weather, only applying heat to keep out the frost during the night or to expel the damp, with the assistance of air through the day; remove all decayed or injured leaves, watering only such plants as require it. Commence the forcing of Rhododendrons, Kalmias, Roses, Hyacinths, Tulips, in the stove or in pits.

Flower Garden, &c.

Plant dried tubers of border flowers, but the finer sorts had better be deferred till spring. Plant deciduous trees and shrubs as long as the weather continues favourable. Dig and dress flower borders and shrubberies.

DECEMBER.

Kitchen Garden.

There are little or no crops sown at this season. A first sowing of early Peas may be made, if not sown last month; or a second, if these have suffered by accidents from vermin. Mice and rats are often wonderfully destructive at this season. The fields are bare, and such ravenous visitors troop into our gardens, and make a clean sweep of such tender morsels as they can find. Black slugs are also very active underground, and manage to destroy our crops at times in spite of all our precautions. A little earth should be drawn up to Peas and Beans in dry weather, to nourish, shelter, and strengthen the stems. Earth up Celery in dry weather, and protect from frost. Take up a week's supply at a time.

A few of the earliest varieties of Radishes may be sown at the foot of a south wall, or on a south sloping bank, to be sheltered with a thin layer of straw during severe weather. A pinch of Early Horn Carrot may be sown in similar places, and receive the same treatment. Endive may be taken up and placed in the cellar to preserve and blanch. Plant the roots in sand or earth, and keep the tops cool and dry, and in the dark.

Place a few roots of Rhubarb, Seakale, and Asparapus in warm places, to excite growth.

Hoe the ground among Onions, Spinach, and Cabbages. Remove all dying or dead leaves, and see that no frost-killed vegetables are allowed to pollute the air with their abominable odour. Nothing can be more offensive nor more unwholesome.

Fruit Garden.

Now the boughs are bare, all pruning ought to be pushed forward in suitable weather. It is not good practice to prune during severe frost. The wood is apt to split and rive if cut in a frozen condition. But at all other seasons prune hardy fruit trees and bushes. Training is a cold business in December. Still, by picking mild days, or glimpses of sunshine, and by feeding the fire of enthusiasm within, it is astonishing how nimble and expert and warm the fingers become even in training trees on the bleak face of a bare wall.

The cleaning of trees should precede training, though we have placed it after it here. Trees ought to be unfastened from the wall and untied, to be thoroughly cleaned. The process of cleaning begins with the removal of all extraneous matter, such as dead leaves, rotten fruit, decaying bark, soot, dust, or other matters. These attract and conceal insect pests, and their removal is chiefly a precautionary or preventive measure. Then there are direct attacks upon scale, American blight, and larvæ of various kinds. All these must be washed, scrubbed, or scraped off, and bodily removed.

Forcing, &c.

Go on with the usual culture of those houses which have been commenced, or are now put into operation, attending to the necessary degrees of heat, &c.; the same attention to hotbeds and pits will be necessary as in the last month. Continue the forcing of Asparagus, Rhubarb, Seakale, and Mushrooms in pits, or in the Mushroom house.

Greenhouse, &c.

The directions for last month will be found equally applicable for this.

Flower Garden, &c.

The directions for last month will also be found applicable to this. Rake and sweep leaves from lawns and gravel walks, repairing the latter as occasion may require.

Agricultural Statistics.

PRINCIPAL CROPS.		1873.	1874.	1875.	1876.	1877.	1878.	1879.
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat...	England..	3252802	3391440	3128547	2823342	2987129	3041241	2718992
	Wales.....	116852	117869	111797	94423	100226	101813	94639
	Scotland .	120726	120991	102137	78192	81185	75363	76613
	Gt. Britain.	3490380	3630300	3342481	2995957	3168540	3218417	2890244
Barley or Bere...	England..	1926183	1889722	2090423	2109265	2000531	2062498	2236101
	Wales.....	163613	152425	154444	153647	147212	148116	152491
	Scotland .	246117	245840	264834	270197	269845	259038	278584
	Gt. Britain.	2335913	2287987	2509701	2533109	2417588	2469652	2667176
Oats......	England..	1419128	1356739	1421951	1534249	1489999	1430376	1425126
	Wales.....	244893	235621	237170	242417	239298	234986	226967
	Scotland .	1012206	1004024	1004888	1021764	1024882	1033545	[illegible]
	Gt. Britain.	2676227	2596384	2664009	2798430	2754179	2698907	[illegible]
Potatoes.	England..	309419	314571	320477	707798	303964	301852	323992
	Wales.....	44936	45379	44505	42581	42942	40816	42609
	Scotland .	160327	160480	157671	154709	165565	165763	174743
	Gt. Britain.	514682	520430	522653	505088	512471	508431	541344
Turnips and Swedes	England..	1540307	1560857	1569049	1561116	1495885	1466973	1457762
	Wales.....	70821	70843	70326	72049	70813	67531	67349
	Scotland .	510780	501636	503323	512408	506757	497356	491964
	Gt. Britain.	2121908	2133336	2142698	2145573	2073455	2031860	2017075
Clover, &c. under rotation .	England..	2678311	2618655	2608106	2787103	2737387	2785097	2674949
	Wales.....	360555	365078	360596	360159	351797	356486	347743
	Scotland .	1327952	1357009	1385369	1393011	1405032	1431524	1450951
	Gt. Britain..	4366818	4340742	4354071	4540273	4494216	4573107	4473373
LIVE STOCK.		Number.	Number.	Number.	Number.	Number.	Number.	Number.
Cattle ...	England..	4173635	4305440	4218470	4076410	3979650	4034552	4128940
	Wales ...	642857	665105	651274	636644	616209	608189	643815
	Scotland .	1148057	1154846	1133080	1131087	1102074	1095387	1083601
	Great Britain...	5964549	6125491	6012824	5844141	5697933	5738128	5856356
Sheep ...	England..	19169851	19859758	19114634	18320091	18330377	18444004	18445522
	Wales ...	2966862	3064696	2951810	2873141	2862013	2925806	2873460
	Scotland .	7290922	7389487	7100994	6989719	6968774	7036396	6838068
	Great Britain...	29427635	30313941	29167438	28182951	28161164	28406206	28157080
Pigs* ...	England..	2141417	2058781	1875357	1924033	2114751	2124722	1771081
	Wales ...	211174	213754	203348	215488	230720	218337	192757
	Scotland .	147668	150297	151213	154099	153257	140189	127721
	Great Britain...	2500259	2422832	2229918	2293620	2498728	248324	2091559

* Exclusive of those kept in towns and by cottagers with less than ¼ of an acre of land.

THE
WEATHERCOCK PAPERS.

SEASONS AND HARVESTS
IN THE
XVII$^{TH.}$ & XIX$^{TH.}$ CENTURIES.

THE "Master of Meteorology," as Mr Glaisher may be called, has furnished in various records the *basis* of the following Notes, which have been amplified from numerous other sources that weather observers and lovers of the country and of books have studied and noted :—

The mean temperature of the years from 1771 to 1849 is thus calculated:—

	Spring.	Summer.	Autumn.	Winter.	Year.	
1771–1849.	46.4°	60°	49.3°	37.6°	?	Glaisher.
1815–1849.	47.55°	61.43°	50.42°	38.22°	49.40°	Belleville.

⁂ The period of the seasons being reckoned:—

Spring.—March, April, and May.
Summer.—June, July, August.
Autumn.—September, October, November.
Winter.—December, January, February.

Thus the winter includes the months of two years.

1771. 47/2 This year was characterized by very sharp frosts till April 20. On February 12 the reading of the thermometer was as low as 4°. The month of May was warm. The summer was cool and dry. October was a wet and windy month; and the weather was mild to the end of the year. The severe weather of the beginning of the year caused a bad seed-time, and the harvest was very late. Spring and autumn were *cold*.

* Severe frosts till the last week in January. To the first week in February, rain and snow; to the end of February, spring weather. To the end of the third week in April, frosty weather. To the end of the first fortnight in May, spring weather, with copious showers. To the end of June, dry, warm weather. The first fortnight in July, warm, rainy weather. To the end of September, warm weather, but in general cloudy, with showers. October, rainy. November, frost, with intervals of fog and rain. December, in general bright, mild weather, with hoar frosts.—W.

1772. 50/8 The beginning of January was mild; from the middle of January frosts and great snows were frequent, and continued to the middle of March. The summer was very fine. The autumn was mild but wet, and there was no frost till December 22. The spring was cold.

* To the end of the first week in February, frost and snow. To the end of the first fortnight in March, frost, sleet, rain, and snow. To the middle of April, cold rains. To the middle of May, dry weather, with cold, piercing winds. To the end of the first week in June, cool showers. To the middle of August, hot, dry summer weather. To the end of September, rain, with storms and thunder. To December 22, rain, with mild weather. December 23, the first ice. To the end of the month, cold, foggy weather.—W.

⁂ The Editor submits the following brief records as but a scaffolding of the seasons, useful for reference, and from which, in future editions, will be built up a really Complete Summary of the Weather and Harvests that will be valuable to the Husbandman, Merchant, and Naturalist. He has a great bulk of data—scientific and agricultural—to draw upon, and will be glad for observers to forward him *a line for any year* that it may be suitable to incorporate in these pages. The years marked with an asterisk refer to Gilbert White's records; those marked H. C. to the Lifelong Memoranda of a Farmer, and those of others are from Mr Belleville's records, others from Mr Lawes', and from statistics too many in number to be quoted.

1773. 51/ With the exception of the latter part of February, which was stormy and wet, there was much fine weather till the beginning of May; then many mornings were frosty, after which heavy rain fell frequently till June. The summer was fine. The autumn was wet; and there was no frost till December 22.

* The first week in January, frost; thence to the end of the month, dark, rainy weather. The first fortnight in February, hard frost. To the end of the first week in March, misty, showery weather. Bright spring days to the close of the month. Frequent showers to the latter end of April. To the end of June, warm showers, with intervals of sunshine. To the end of August, dry weather, with a few days of rain. To the end of the first fortnight in November, rainy. The next four weeks, frost; and thence to the end of the year, rainy.—W.

1774. 52/8 The year began with severe frost, and for nearly two months the ground was frost-bound. Occasionally there were great rains or snow. The weather was more moderate in April. The summer was cool, with heavy rains. The autumnal months were wet, particularly September. Some snow fell in November and beginning of December. This year was remarkably wet.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	61°	48°	40°	49°

* Frost and rain to the end of the first fortnight in March; thence to the end of the month, dry weather. To April 15, showers; thence to the end of April, fine spring days. During May, showers and sunshine in about an equal proportion. Dark, rainy weather to the end of the third week in July; thence to August 24, sultry, with thunder and occasional showers. To the end of the third week in November, rain, with frequent intervals of sunny weather. To the end of December, dark, dripping fogs.—W.

1775. 48/4 The weather was mild at the beginning of the year. The summer was dry and hot. Thunder-storms were frequent in autumn. The year was very fine; and grain was cheaper than it had been for many years past.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	62°	48°	35°	48⅓°

* To the end of the first fortnight in March, rain almost every day. To the first week in April, cold winds, with showers of rain and snow. To the end of June, warm, bright weather, with frequent showers. The first fortnight in July, almost incessant rains. To August 26, sultry weather, with frequent showers. To the end of the third week in September, rain, with a few intervals of fine weather. To the end of the year, rain, with intervals of hoar frost and sunshine.—W.

1776. 38/2 In January there fell a greater quantity of snow than had fallen for some years, and the frost was supposed to have been the most severe since 1740. The frost went away at the beginning of February, and the weather following was mild and wet. It became hot about the middle of April. May was cold and dry, with north winds; after this the weather was mostly fine till the end of December, when there was a sharp frost.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	61°	50°	36°	48°

* To January 24, dark, frosty weather, with much snow. March 24, to the end of the month, foggy, with hoar frost. To May 30, dark, dry, harsh weather, with cold winds. To the end of the first fortnight in July, warm, with much rain. To the end of the first week in August, hot and dry, with intervals of thunder showers. To the end of October, in general fine seasonable weather, with a considerable proportion of rain. To the end of the year dry, frosty weather, with some days of hard rain.—W.

1777. 45/6 The year began with a sharp frost, and heavy falls of snow continued till towards the end of February. For a few days about Lady Day the weather was unusually hot, the reading of the thermometer being about 70°; after this the weather was windy and cold till June. The latter part of the summer and autumn was fine. The year ended with frost and snow.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	61°	51°	35°	48°

* To January 10, hard frost. To January 20, foggy, with frequent showers. To February 18, hard, dry frost, with snow. To the end of May, heavy showers, with intervals of warm, dry, spring days. To July 8 dark, with heavy rain. To July 18, dry, warm weather. To the end of July, very heavy rains. To October 12, remarkably fine, warm weather. To the end of the year, gray, mild weather, with but little rain, and still less frost.—W.

1778. 42/ There were frost and snow at the beginning of the year. The beginning of April was fine. The summer was fine and hot; supposed at the time to have been as fine a summer as that of 1762, if not as fine as the summer of 1750. Frosty mornings began in September, but were less frequent afterwards. On the last day of this year there was a violent storm, supposed by some to have been as violent as that of 1703.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	64°	45°	40°	50°

* To January 13, frost, with a little snow; to January 24, rain; to the 30th, hard frost. To February 23, dark, harsh, foggy weather, with rain. To the end of the month, hard frost, with snow. To the end of the first fortnight in March, dark, harsh weather. From the 1st to the end of the first fortnight in April, spring weather. To the end of the month, snow and ice. To June 11, cool, with heavy showers. To July 19, hot, sultry, parching weather. To the end of the month,

heavy showers. To the end of September, dry, warm weather. To the end of the year, wet, with considerable intervals of sunshine.—W.

779. 33/8 After the beginning of January there was no frost. The spring months were remarkably warm. In February wall-fruit flowered. The middle of April was quite hot, as were the summer and autumn. About the middle of November there was a little frost, and again on December 22. There was much sickness this year.

Spring.	Summer.	Autumn.	Winter.	Year.
50.08°	62°	51°	34°	49°

* Frost and showers to the end of January. To April 21, warm, dry weather. To May 8, rainy. To June 7, dry and warm. To July 6, hot weather, with frequent rain. To July 18, dry, hot weather. To August 8, hot weather, with frequent rains. To the end of August, fine, dry harvest weather. To the end of November, fine autumnal weather, with intervals of rain. To the end of the year, rain, with frost and snow.—W.

1780. 35/8 This year began with a frost almost as severe as that of 1772; there was not much snow, and the weather continued severe until the end of February. The month of March was warm, as was the whole spring. It was hot from July to September, and mostly mild till Christmas, when a frost set in. The year was sickly.

Spring.	Summer.	Autumn.	Winter.	Year.
49°	62°	50°	38°	49°

* To the end of January, frost. To the end of February, dark, harsh weather, with frequent intervals of frost. To the end of March, warm, showery, spring weather. To the end of April, dark, harsh weather, with rain and frost. To the end of the first fortnight in May, mild, with rain. To the end of August, rain and fair weather in pretty equal proportions. To the end of October, fine autumnal weather, with intervals of rain. To November 24, frost. To December 16, mild, dry, foggy weather. To the end of the year, frost and snow.—W.

1781. 44/8 There was a little frost at the beginning of the year; the spring was mild, the summer was hot, and the ground was much burned. Autumn was fine and pleasant, and there were only a few frosty mornings during the remainder of the year.

Spring.	Summer.	Autumn.	Winter.	Year.
46½°	63½°	49½°	38½°	49.8°

* To January 25, frost and snow. To the end of February, harsh and windy, with rain and snow. To April 5, cold, drying winds. To the end of May, mild spring weather, with a few slight showers. June began with heavy rain, but thence to the end of October, dry weather, with a few flying showers. To the end of the year, open weather, with frequent rains.—W.

1782. 47/10 The beginning of the year was mild, but in February it was frosty, and the remainder of the winter was severe. The spring was cold; nearly 12 inches of rain fell in April and May. The weather was fine in June, but bad afterwards. The autumn was cold; it was severe in November and during the first half of December.

Spring.	Summer.	Autumn.	Winter.	Year.
43°	56°	44°	35°	45.5°

* To February 4, open, mild weather. To February 22, hard frost. To the end of March, cold, blowing weather, with frost, and snow, and rain. To May 7, cold, dark rains. To the end of May, mild, with incessant rains. To the end of June, warm and dry. To the end of August, warm, with almost perpetual rains. The first fortnight in September, mild and dry; thence to the end of the month, rain. To the end of October, mild, with frequent showers. November began with hard frost, and continued throughout, with alternate frost and thaw. The first part of December, frosty; the latter part, mild.—W.

1783. 52/8 The spring was pleasant, with frosty mornings very constantly till near April. A remarkable haze was prevalent over Europe during the summer; the autumn was fine, and the weather was mostly mild till the last week in December, when a great fall of snow took place.

Spring.	Summer.	Autumn.	Winter.	Year.
45°	61°	49°	32°	48°

* To January 16, rainy, with heavy winds. To the 24th, hard frost. To the end of the first fortnight in February, blowing, with much rain. To the end of February, stormy, dripping weather. To May 9, cold, harsh winds (thick ice on May 5). To the end of August, hot weather, with frequent showers. To September 23, mild, with heavy driving rains. To November 12, dry, mild weather. To December 18, gray, soft weather, with a few showers. To the end of the year, hard frost.—W.

1784. 48/10 There was a steady frost, with snow, till February 21, and till the end of March the mornings were frosty; at the end of March there were cold winds, with snow. This weather continued until the middle of April, and till the first week of May frosty mornings were frequent, and the remainder of May was exceedingly hot. There were a few hot days in July, but the weather was precarious throughout the autumn, and in December the frost was as severe as it was in January.

Spring.	Summer.	Autumn.	Winter.	Year.
45°	55°	48°	32°	45.1°

* To February 19, hard frost, with two thaws: one January 14, the other February 5. To February 28, mild, wet fogs. To March 3, frost with ice. To March 10, sleet and snow. To April 2,

snow and hard frost. To April 27, mild weather, with much rain. To May 12, cold, drying winds. To May 20, hot, cloudless weather. To June 27, warm, with frequent showers. To July 18, hot and dry. To the end of August, warm, with heavy rains. To November 6, clear, mild, autumnal weather, except a few days of rain at the latter end of September. To the end of the year, fog, rain, and hard frost (on December 10, the thermometer one degree below 0.).—W.

1785. 51/10 The severe frost of the preceding month broke early in January, but on the last day of January a second very severe frost set in, and continued until the middle of March. The winter was most severe; spring cold; the summer and part of autumn were showery. A heavy fall of snow took place at Christmas, with severe frost.

Spring.	Summer.	Autumn.	Winter.	Year.
44½°	59°	48°	34°	46.4°

* A thaw began on January 2, and rainy weather, with wind, continued to January 28. To March 15, very hard frost. To March 21, mild, with sprinkling showers. To April 7, hard frost. To May 17, mild, windy weather, without a drop of rain. To the end of May, cold, with a few showers. To June 9, mild weather, with frequent soft showers. To July 13, hot, dry, weather, with a few showery intervals. To July 22, heavy rain. To the end of September, warm, with frequent showers. To the end of October, frequent rain. To November 18, dry, mild weather, (Haymaking finished November 9, and the wheat harvest November 14.) To December 23, rain. To the end of the year, hard frost.—W.

1786. 38/10 The frosts at the beginning of the year were of short duration; spring cold; and from the beginning of March there was a most severe frost of a fortnight's duration. Cold E. and N.E. winds were prevalent, with frosty mornings, till the beginning of May. June and July were moderately fine. August was cold and showery, and from this time until the end of the year there was a great deal of rain.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	59°	39°	37°	45.8°

* To January 7, frost and snow. To January 13, mild, with much rain. To January 21, deep snow. To February 11, mild, with frequent rains. February 21, dry, with high winds. To March 10, hard frost. To April 13, wet, with intervals of frost. To the end of April, dry, mild weather. On May 1 and 2, thick ice. To May 10, heavy rain. To June 14, fine, warm, dry weather. From July 8 to 11, heavy showers. To October 13, warm, with frequent showers. To October 19, ice. To October 24, mild, pleasant weather. To November 3, frost. To December 16, rain, with a few detached days of frost. To the end of the year, frost and snow.—W.

1787. 41/2 The year began with open weather. April was cold, with north winds, and vegetation was *stopped*. During April and May frosty mornings were frequent. There was a sharp frost on the morning of June 7. The summer was cold; the autumn was mild. There was a heavy fall of snow and a week's frost at the end of the year.

Spring.	Summer.	Autumn.	Winter.	Year.
45½°	60°	47°	38½	48.1°

* To January 24, dark, moist, mild weather. To January 28, frost and snow. To February 16, mild, showery weather. To February 28, dry, cool weather. To March 10, stormy, with driving rain. To March 24, bright, frosty weather. To the end of April, mild, with frequent rain. To May 22, fine, bright weather. To the end of June, mostly warm, with frequent showers (*on June 7*, ice as thick as a crown-piece). To the end of July, hot and sultry, with copious rain. To the end of September, hot, dry weather, with occasional showers. To November 23, mild, with light frosts and rain. To the end of November, hard frost. To December 21, still and mild, *with rain*. To the end of the year, frost.—W.

1788. 45/ January and February were mild, the latter month being wet. There was a fortnight's frost in March. There were periods of hot weather in April, May, and June. The summer was in general dry; autumn was fine. There was a gentle frost at the beginning of December; then an excessively severe frost set in, with heavy falls of snow. This year was remarkable for abundance of fruit.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	59°	48°	34°	47.9°

* To January 13, mild and wet. To January 18, frost. To the end of the month, dry, windy weather. To the end of February, frosty, with frequent showers. To March 14, hard frost. To the end of March, dark, harsh weather, with frequent showers. To April 4, windy, with showers. To the end of May, bright, dry, warm weather, with a few occasional showers. From June 28 to July 17, heavy rains. To August 12, hot, dry weather. To the end of September, alternate showers and sunshine. To November 22, dry, cool weather. To the end of the *year, hard* frost.—W.

1789. 51/2 Very heavy storms of wind and snow till the middle of January. Great rivers were frozen over. After the frost broke the weather was mild, but windy and wet. During March there were constant north winds, heavy falls of snow, and sharp frosts. The summer was mostly wet, after the *cold* spring.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	56°	47°	39°	46.7°

* To January 13, hard frost. To the end of the month, mild, with showers. To the end of February, frequent rain, with snow showers, and heavy gales of wind. To March 13, hard frost, with snow. To April 18, heavy rain, with frost, and snow, and sleet. To the end of April, dark, cold weather, with frequent rains. To June 9, warm spring weather, with brisk winds, and frequent showers. From June 4, to the end of July, warm, with much rain. To August 29, hot, dry, sultry weather. To September 11, mild, with frequent showers. To the end of September, fine autumnal weather, with occasional showers. To November 17, heavy rain, with violent gales of wind. To December 18, mild, dry weather, with a few showers. To the end of the year, rain and wind.—W.

90. 54/9 The weather was mild and open till April, when the first snow fell. The weather during the first part of that month was the most severe during the winter. The summer was cold, cloudy, and windy. Autumn fine. December stormy and changeable.

Spring.	Summer.	Autumn.	Winter.	Year.
45°	58°	48°	39°	48.1°

*To January 16, mild, foggy weather, with occasional rains. To January 21, frost. To January 28, dark, with driving rains. To February 14, mild, dry weather. To February 22, hard frost. To April 5, bright, cold weather, with a few showers. To April 15, dark and harsh, with a deep snow. To April 21, cold, cloudy weather, with ice. To June 6, mild, spring weather, with much rain. From July 3 to July 14, cool, with heavy rain. To the end of July, warm, dry weather. To August 6, cold, with wind and rain. To August 24, fine harvest weather. To September 5, strong gales, with driving showers. To November 26, mild autumnal weather, with frequent showers. To December 1, hard frost and snow. To the end of the year, rain and snow, and a few days of frost.—W.

791. 48/7 Till January 6 there was no frost; the weather was mild until towards the end of April; the former part of the summer was cold; frosts were frequent till the middle of June; during November and December storms and falls of snow, with frost, were frequent.

Spring.	Summer.	Autumn.	Winter.	Year.
46.5°	59.5°	48.5°	36°	48.1°

* To the end of January, mild, with heavy rains. To the end of February, windy, with much rain and snow. From March to the end of June, mostly dry, especially June. March and April, rather cold and frosty. May and June, hot. July, rainy. Fine harvest weather, and pretty dry, to the end of September. Wet, October, and cold towards the end. Very wet and stormy in November. Much frost in December.—W.

1792. 43/ There were many sharp frosts till March, with stormy and wet weather; the summer was wet and cold; the autumn was wet; December was cloudy, with very little frost. This was a very wet year.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	58°	49°	38½°	48°

* Some hard frost in January, but mostly wet and mild. February, some hard frost, and a little snow. March, wet and cold. April, great storms on the 13th, then some very warm weather. May and June, cold and dry. July, wet and cold; indifferent harvest, rather late and wet. September, windy and wet. October, showery and mild. November, dry and fine. December, mild.—W.

1793. 49/3 January, February, and March were mild. There was a great fall of snow in the first week in April. The former part of the summer was cold. July was wet, but the autumn was fine, mild, and calm, with no frost till the end of the year. The spring was cold, referring to spring as the months of March, April, and May.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	59°	49½°	39½°	47.9°

1794. 52/3 The year began with frost. February was very mild. The spring was warm till May, which was very cold. July was hot. Autumn was wet and mild till the first part of December; then the cold was severe, with heavy snow.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	61°	49°	32°	48.9°

1795. 75/2 Severe frost, which continued till the end of March. Great falls of snow. The floods were so great that nearly all the bridges in England were injured. Some snow fell in April. There were some hot days in July, but the summer was generally cold; the autumn fine in December. Much injury was done to shipping by strong south-west winds. There were no frosts.

Spring.	Summer.	Autumn.	Winter.	Year.
45°	56°	51°	43°	47.2°

1796. 78/7 January was very warm, with thunder-storms; no frost till March. The summer was cool; autumn very fine. In December a severe frost set in, and the thermometer in many places on the 24th was below zero.

Spring.	Summer.	Autumn.	Winter.	Year.
45½°	57°	48°	34°	47.8°

1797. 53/9 During a few days in January the frost continued; after this, till the end of March, scarcely any rain fell. From April till September there were frequent rains. The summer was cold; the autumn fine, and the weather continued open until the end of the year.

Spring.	Summer.	Autumn.	Winter.	Year.
45°	58°	47½°	38½°	47.2°

1798. 51/10 With the exception of a few frosts till March, the weather was open and mild. The summer was fine, as was the autumn until the beginning of December; after this a severe frost set in, and the thermometer was as low as 5.8°.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	61°	49°	37°	48.6°

1799. 69/ The severe frost continued until the beginning of January, and again set in towards the end of the month, with much snow. The spring was cold. From April till the middle of November was wet. December was foggy; on the 17th a severe frost set in. The whole year was very cloudy.

Spring.	Summer.	Autumn.	Winter.	Year.
43°	56°	48°	35°	45.7°

1800. / During the first and last three months the weather was unsettled and rough. The summer was moderately fine.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	60½°	49°	38½°	48.3°

1801. 119/6 The first four months were very dull, and snow fell till the end of April; much rain in May and June. Summer and autumn fine. There was some snow in November.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	60½°	50°	36°	49°

Food scarce. Wheat 151/2 in March. Average Wheat imports last ten years, 470,342 qrs.

1802. 69/10 With the exception of July, which was cold, the year was moderately fine.

Spring.	Summer.	Autumn.	Winter.	Year.
46½°	60°	50°	37°	47.5°

1803. 58/10 A cold, dry spring; snow in February; June cold and wet. Fine summer and autumn, and open winter.

Spring.	Summer.	Autumn.	Winter.	Year.
46½°	60½°	48°	41°	48.2°

1804. 62/3 January was warm; snow occasionally until the end of March. Summer and autumn warm, and a mild winter.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	60½°	51°	36°	49.5

1805. 89/9 With the exception of autumn, which was warm, the year was generally cold.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	58°	50°	40°	47.7°

Harvest hot and dry.

1806. 79/1 January was wet and warm; snow in February; very dull and unsettled until the end of April; after this the weather was fine until the end of the year.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	61°	52°	41°	50.5°

1807. 75/4 A cold spring; snow fell to the end of April; May wet. Summer fine; cold autumn; snow fell in November and December.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	61½°	48°	37°	48.3°

1808. 81/4 On April 19 there was a heavy fall of snow. A fine, productive harvest.

Spring.	Summer.	Autumn.	Winter.	Year.
45½°	61½°	48°	38½°	48.1°

Several deaths from sunstroke.

* Nightingale.	Black Thorn.	Haying.	Wheatear.	Harvest.	Hop-picking.
†H. C. April 13	May 1	June 16–29	June 24	Aug. 5–26	—

April 19, a heavy fall of snow for four hours.

1809. 97/4 Till the last week in April very cold; May fine and hot. Summer and autumn fine.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	58½°	48°	38°	48°

Wet summer. Bad crop. Temperature below average.

†H. C. April 22	April 25	June 24–July 15	July 1	Aug. 10–Sept. 2	—

Last week in April, very cold, wet, frosty and unpleasant weather.

1810. 106/5

Spring.	Summer.	Autumn.	Winter.	Year.
46°	59°	51°	37°	48.7°

Wet and cold season. Bad crop. Average yearly Wheat imports last ten years, 555,959 qrs. Average rental, England and Wales, 17/3½.

†H. C. April 21	April 30	June 18–July 6	June 28	Aug. 14–Sept. 5	—

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* These headings refer to date when *Nightingale* was first heard, when *Blackthorn* flowered, when *Haying* began and finished, when *Wheatears* first appeared, when *Harvest* began and ended, when *Hop-picking* commenced, on the *Farm* of a *single observer for* 65 years.

1. 49/3 Hot spring.

Spring.	Summer.	Autumn.	Winter.	Year.
48½°	56°	52°	38½°	49.1°

Wet and cold. Windy June. Five-eighths of an average crop.

† H. C. April 13 April 20 June 3–21 June 10 July 24–Aug. 26 —

2. 126/6

Spring.	Summer.	Autumn.	Winter.	Year.
44°	55°	49°	33.5°	46.5°

Wet and cold. Very bad crop. Worst year of the century.

† H. C. April 16 April 27 June 24–July 8 July 1 Aug. 19–Sept. 9 —

13. 109/9 An immensely productive harvest, and a general thanksgiving for it.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	55½°	48°	32.5°	47.2°

Hot and dry season.

† H. C. April 15 April 15 June 22–July 4 June 22 Aug. 12–Sept. 9 —

14. 74/4 January 4 the deepest snow that had been known for 40 years began; was some days falling; continued on the ground for five weeks; drifts, in many places 15 feet high. The frosts continued 12 weeks. The whole season *cold*.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	55°	47½°	33½°	45.8°

Hot and dry.

† H. C. April 13 April 22 June 28–July 13 July 4 Aug. 21–Sept. 7 —

January 4, the deepest snow that had been known for forty years began—was some days falling—continued on the ground for five weeks—at places the drifts were fifteen feet high—the frost continued twelve weeks to March 20.

815. 65/7 Hot and dry. Summer temperature, 62.10.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	59°	51°	37°	49°

† H. C. April 12 April 6 June 10–24 June 22 Aug. 9–26 —

816. 78/6 Cold spring; the early part of the year was severe and frosty, and again on September 3 a severe frost that produced ice.

Spring.	Summer.	Autumn.	Winter.	Year.
44½°	55°	50½°	39½°	46.4°

Summer temperature, 58.37.

† H. C. April 19 May 12 June 25–July 31 July 14 Aug. 29–Oct. 12 —

From April 12 to 15, snow remained on the ground, and the weather was severe and frosty. September 3, a severe frost which produced ice. This year is considered to be more alike to that of 1879 than any other of the present century.

1817. 97/11 The month of August was very wet, succeeded in September by a fine harvest.

Spring.	Summer,	Autumn.	Winter.	Year.
44½°	55°	49°	37½°	47.7°

Summer temperature, 60.30.

† H. C. May 2 April 28 June 21–July 14 June 24 Aug. 15–Sept. 10 —

1818. 86/3 On May 8 a deluge of rain fell, after which scarcely any rain fell till September 5 (seventeen weeks), during which all vegetation was burned up.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	64°	54½°	39°	50.8°

Summer temperature, 65.60 Over an average crop.

† H. C. April 23 April 25 June 18–30 June 8 July 27–Aug. 12 Aug. 31

1819. 74/6 Snow 6 inches deep on October 22.

Spring.	Summer.	Autumn.	Winter.	Year.
48½°	62½°	48½°	36°	49.3°

Severe frost May 28. Hot summer, July, August, and part September. Temperature, 63.27.

† H. C. April 10 May 12 June 19–July 24 June 19 July 31–Aug. 25 Sept. 8

October 22, snow six inches deep.

1820. 67/10 Hot and dry. Average yearly Wheat imports last ten years, 429,076 qrs. Summer temperature, 60.48.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	56°	48°	37°	47.4°

† H. C. April 18 April 20 July 3–31 June 25 Aug. 9–Sept. 13 Sept. 13

1821. 56/1 Wet and cold. Summer temperature, 59.37.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	56°	52½°	42½°	49.3°

† H. C. April 20 April 20 July 10–Aug. 13 July 9 Aug. 21–Sept. 19 Sept. 10

1822. 44/7 Hot spring. No rain from May 2 till July 25; nine weeks of very hot days.

Spring.	Summer.	Autumn.	Winter.	Year.
50°	62°	52°	36°	51°

Temperature, 63.10. Full crop, of very fine quality.
† H. C. April 21 April 10 June 16–July 10 June 10 July 16–Aug. 8 Sept. 2

1823. 53/4 Rain every day from June 29 to August 15.

Spring.	Summer.	Autumn.	Winter.	Year.
45½°	58½°	49°	36½°	47.3°

Temperature, 60.35.
† H. C. April 21 May 1 July 7–Aug. 15 June 19 Aug. 16–Sept. 20 Sept. 2

1824. 63/11 A very wet summer, but not cold. Crops of corn light; hay heavy.

Spring.	Summer.	Autumn.	Winter.	Year.
44½°	59°	51½°	39°	48.3°

Great hailstorms. Temperature, 61.58.
† H. C. April 24 May 3 July 5–Aug. 10 June 26 Aug. 16–Sept. 30 Sept. 14

1825. 68/6 The produce of 12 acres of hops was sold for 5s. The crop was gathered, and proved to be 24 lb weight.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	63°	51°	38°	49.6°

Fine summer. Temperature, 62.57. July very hot and dry, 97.0 in shade registered. Early good harvest.
† H. C. April 19 April 26 June 28–July 18 June 20 July 22–Aug. 21 —
Sold the produce of twelve acres of hops for five shillings, the crop was gathered and proved to be twenty-four pounds in weight, 2 lbs. per acre only.

1826. 58/8 Fine summer.

Spring.	Summer.	Autumn.	Winter.	Year.
47½°	64°	50°	36°	49.9°

Very hot. Temperature, 65.92. Fine crop.
† H. C. April 16 April 12 June 26–July 18 June 21 July 23–Aug. 15 Sept. 4

1827. 56/9 Fine summer.

Spring.	Summer.	Autumn.	Winter.	Year.
47½°	60°	51°	41°	48.5°

Summer temperature, 60.93.
† H. C. April 15 April 18 June 25–July 21 June 24 Aug. 3–28 Sept. 14

1828. 60/5 Very heavy rain from July 6 to August 15.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	60½°	51°	38°	50.1°

Wet and cold. Summer temperature, 60.59.
† H. C. April 16 April 19 June 29–Aug. 16 June 20 July 31–Aug. 26 Sept. 15

1829. 66/3 Rain more or less from June 16 to September 20, being ninety-six days. The season was not particularly cold, but exceedingly wet. (Year Editor was born. S.P.Q.R.)

Spring.	Summer.	Autumn.	Winter.	Year.
46°	59°	46°	32°	46.6°

Summer cold. Temperature, 58.81.
† H. C. April 18 May 7 July 15–Sept. 1 June 24 Aug. 4–Oct. 6 Sept. 21
Though April 9 is stated as the day on which oat-sowing was finished, yet an experiment was tried by sowing black tartar oats on May 13; the weather was much against them at first, but they turned out well and were carried on October 6, the last load going into the barn white with snow.

1830. 64/3 A severe frost till the middle of February. Spring months warm.

Spring.	Summer.	Autumn.	Winter.	Year.
49½°	59°	52°	35°	47.8°

Cold summer. Average yearly Wheat imports last ten years, 534,762 qrs. Temperature, 59.50.
† H. C. April 10 April 18 July 5–Aug. 2 June 26 Aug. 9–Sept. 1 Sept. 13
A severe frost till February 7; March was fine, dry and warm, without a storm or a shower; April 1 was snowy till noon, whilst a swallow was seen flying about at Trevereux.

1831. 66/4 A severe frost on May 6, which checked even the meadow grass that it never recovered from the effects. Another severe frost on May 28.

Spring.	Summer.	Autumn.	Winter.	Year.
48½°	62°	51½°	38½°	50.4°

† H. C. April 12 April 20 July 2–27 June 16 July 29–Aug. 22 Aug. 29

832. 55/8 Summer wet. Temperature, 62.58.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	61°	49°	39°	49.1°

Summer temperature, 60.97.
† H. C. April 18 April 25 July 2–28 June 21 Aug. 4–Sept. 4 Sept. 10

833. 52/11 Wet and cold. Summer temperature, 59.25.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	58½°	51°	43°	49°

† H. C. April 21 May 1 June 29–July 29 June 18 July 31–Aug. 21 Sept. 16

834. 46/2 A fine, dry, warm summer.

Spring.	Summer.	Autumn.	Winter.	Year.
48½°	62½°	50°	41°	51°

Summer temperature, 62.34. One of the best harvests known.
† H. C. April 23 May 1 June 18–July 30 June 16 July 23–Aug. 12 Sept. 15

1835. 39/4 In April a fall of snow for two days. A fine autumn.

Spring.	Summer.	Autumn.	Winter.	Year.
47½°	62½°	48°	36°	49.2°

Hot early in June, through July and August. No rain from July 5 to August 25. Summer temperature, 62.46. Good crop, much straw.
† H. C. April 24 April 14 July 1–25 June 15 July 27–Aug. 15 Sept. 4
April 16 and 17, a fall of snow for two days. Although August 20 was noted as the time of the first and largest flight of swallows, yet it was observed that many remained longer, and they were not all gone this year until October 20—there are always many stragglers which remain longer than the principal flight, and some few, which appear to have lost their instinct, remain until the winter kills them by starvation and cold.

1836. 48/6 October 29 snow fell in a frosty state of weather, and remained on the ground a week. December 24 much snow fell, and the roads were stopped.

Spring.	Summer.	Autumn.	Winter.	Year.
47°	60½°	51°	38°	48.1°

Summer temperature, 61.73. Medium crop.
† H. C. April 22 April 27 July 4–27 June 20 Aug. 10–Sept. 5 Sept. 12
September 1, swallows almost all gone.
October 29, snow fell in a frosty state of weather, and remained on the ground a week.
December 24, much snow fell at night, which, in many places being drifted, stopped the roads for several days.

1837. 55/10 Coldest spring here recorded; mean temperature, 40.09°; whilst the mean of thirteen other cold springs was 43.02°.

Spring.	Summer.	Autumn.	Winter.	Year.
41°	59½°	49½°	34°	47.3°

Hot and dry. Summer temperature, 61.42.
† H. C. April 25 May 15 July 5–24 July 2 Aug. 14–Sept. 4 Sept. 11

1838. 64/7 January a severe frost commenced, and continued about five weeks, the thermometer being 5° or 6° below zero. Most of the evergreen shrubs were killed. During April continued snow-storms, and very cold. Cold autumn.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	59°	47½°	37°	46.4°

Summer temperature, 60.52.
† H. C. April 23 May 17 July 13–Aug. 10 July 1 Aug. 13–Sept. 1 Sept. 19
January 8, a very severe frost commenced, and it continued about five weeks with some snow, the thermometer being 5 or 6 deg. below zero—most of the evergreen shrubs were killed down to the ground.
April 16, continued snow storms until the 20th, and very cold.
September 10, swallows more than half gone.

1839. 70/8 Cold spring. May 14 snow for four hours in the morning; 15th and 16th much more snow, with severe frost at nights. September was a very wet month.

Spring.	Summer.	Autumn.	Winter.	Year.
43°	59°	48½°	38½°	47.7°

Summer temperature, 60.63. One Wheat stock produced 2,800 grains from 64 straws.
† H. C. April 22 May 6 July 8–Aug. 3 June 25 Aug. 7–Sept. 14 Sept. 16
May 14, small snow for four hours in the morning, 15th and 16th much more, with severe frost at night.

1840. 66/4 Began with continued rain till the middle of February, then a dry spring and summer till Augus 13. The crop of hay was less than half a load per acre.

Spring.	Summer.	Autumn.	Winter.	Year.
46°	59½°	49½°	34½°	47.8°

Average yearly Wheat imports last ten years, 908,118 qrs. Temperature, 60.87.
† H. C. April 21 April 24 July 1–30 June 20 Aug. 3–Sept. 1 Sept. 14

1841. 64/4 After hot spring, wet summer, autumn, and winter.

Spring.	Summer.	Autumn.	Winter.	Year.
49½°	58½°	49½°	38°	48.7°

Summer temperature, 58.91.
† H. C. April 19 April 22 July 3–Aug. 27 June 26 Aug. 12–Sept. 10 Sept. 13

1842. 57/3 A dry summer. The swallows began to leave on September 2. Hay short.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	62½°	42½°	39½°	49.6°

Temperature, 64.11. August very hot; drought severe; destructive hailstorms.
† H. C. April 23 April 24 July 4–23 June 15 Aug 1–22 Aug. 31
The swallows began to leave on September 2, most about the 15th–hay short this year.

1843. 50/1 Hay abundant.

Spring.	Summer.	Autumn.	Winter.	Year.
48°	61°	51°	39°	49.4°

August 24, 2 inches rainfall. Summer temperature, 60.66.
† H. C. April 17 April 16 July 3–Aug. 21 June 24 Aug. 11–Sept. 6 Sept. 18

1844. 51/3 Early autumn. A long and severe winter until March 1845.

Spring.	Summer.	Autumn.	Winter.	Year.
48½°	60°	50½°	35°	48.6°

Drought and heat from early in April throughout summer. Winds veering with sun. Temperature, 60.44.
† H. C. April 19 April 22 July 27–Aug. 20 June 20 July 29–Aug. 29 Sept. 16
August 15, swallows many gone—a long and severe winter, until March 20, 1845.

1845. 50/10 Cold spring and a very wet summer. Hay-making from July 7 till September.

Spring.	Summer.	Autumn.	Winter.	Year.
44°	59°	50½°	43°	47.6°

Temperature, 59.86.
† H. C. April 18 May 5 July 7–Sept. 6 July 6 Aug. 21–Sept. 20 Sept. 29

1846. 54/8 Very dry summer, June to September 22. Temperature, 64.81. Very good crop.
† H. C. April 14 April 10 July 1–Aug. 9 June 23 July 23–Aug. 15 Sept. 7

1847. 69/9 Very dry. Temperature, 61.88. July and August hot. Failure of Potatoes. Wheat, 102/5 in May; in September, 49/6, after fine harvest.
† H. C. April 21 May 4 July 3–26 June 26 Aug. 2–28 Sept. 10
Swallows almost all gone, August 22.

1848. 50/6 Wet spring, then drought; cold, wet summer. Temperature, 60.40. Crop short.
† H. C. April 21 April 17 July 3–Sept. 6 June 26 July 31–Sept. 15 Oct. 9
The corn of all sorts much grown and spoiled with wet.
August 1, on account of the extreme wetness of the season, many of the martins and some of the swallows disappeared.

1849. 44/3 Fine after snowy spring. Summer temperature, 60.84. Corn admitted to United Kingdom, 1/ per qr. Winds veering with sun. Harvest good.
† H. C. April 26 April 25 June 9–July 13 June 28 Aug. 10–Sept. 8 Sept. 10

1850. 40/3 Wet and cold. Deficient harvest. Summer temperature, 60.1.
† H. C. April 12 May 2 June 24–Aug. 9 June 30 Aug. 7–Sept. 9 Sept. 11

1851. 38/6 A good, but late crop. Average temperature.
† H. C. April 15 May 1 July 3–Aug. 2 June 30 Aug. 11–Sept. 1 Sept. 17

1852. 40/9 July very hot. Large area, good early promise, damp and very inferior, harvest ripened *prematurely*, weight light. Wet August.
† H. C. April 26 April 25 July 6–31 June 25 Aug. 3–Sept. 11 Sept. 13
A dry winter and spring, until May 17, very wet until July 4, the rest of which was a *scorching* month, followed by a wet harvest and autumn, the like of which seldom happens.
Very few swallows this year.

853. 53/3 Small area. Wet autumn and spring. Worst crop for years, 14⅞ bushels. Wind veering against sun. August temperature, 59.0
† H. C. April 21 May 16 July 6–Aug. 9 July 6 Aug. 18–Sep. 17 Sept. 26
Rain almost daily until November 1, except for twenty days, from the beginning of August.
Water in mouse pit from November 1852, to June 15, 1854, never known before for so much as a week at one time, in 37 years.

1854. 72/5 One of the best crops on record, fine quality, large area, 35⅛ bushels.
† H. C. April 20 May 6 July 19–Aug. 12 July 8 Aug. 15–Sept. 5 Sept. 25

1855. 74/8 Quality various, slow harvest, yield nearly an average, 27⅝ bushels.
† H. C. April 24 May 21 July 4–Aug. 15 July 10 Aug. 13–30 Sept. 10
Fine summer, the thermometer 11 Fah., the longest night, December 21.

1856. 69/2 Full area, rather wet harvest, quality irregular, 29 bushels. Hot and dry summer. Winds veering with sun. August temperature, 63.6.
† H. C. April 19 April 25 June 27–Aug. 2 June 30 Aug. 13–27 Sept. 4

1857. 56/4 Great heat, and mostly dry from May 11 to September 27. Early and large harvest, quality fine, 35⅝ bushels, full area. Summer temperature, 62.0.
† H. C. April 20 April 28 June 18–July 15 June 15 July 24–Aug. 16 Sept. 2
A very fine summer, hot for two months together, mild autumn till Decemher 31, on which day Roses, Fuchsias, Calceolarias, and Salvias, were in flower and flourishing out of doors at Trevereux.

1858. 45/2 Hot and dry summer to September 22. Bulky, early, good harvest, fair yield, 32⅛ bushels. Winds veering with sun. Summer temperature, 61.9
† H. C. April 16 April 23 June 15–July 26 June 16 July 28–Aug. 23 Sept. 6

1859. 43/9 Very hot summer, July excessively so. Fair promise, early ripening, bulky sheaves, yield below average, quality inferior. Summer temperature, 62.8.
† H. C. April 25 April 6 June 22–July 18 June 14 July 26–Aug. 12 Sept. 5

1860. 53/3 Deficient crop, condition bad, harvest three weeks late, cold, wet, stormy, 25¼ bushels. Winds veering against sun. August temperature, 56.7.
† H. C. April 12 May 14 July 9–Sept. 1 July 12 Sept. 3–Oct. 5 Oct. 1
Wet cold spring, six inches of rain in June. August 25, many swallows gone, wet autumn and winter.

1861. 55/4 Small area, yield deficient, quality good, 26⅞ bushels. Bad French crop.
† H. C. April 24 May 20 July 1–30 June 16 Aug. 10–27 Sept. 12
Remarkable for want of bloom on fruit trees of all sorts, the failure extended to black and white thorns, fine summer and autumn to Christmas.

1862. 55/5 Large area, good early promise, result very bad, quality and quantity, 31⅞ bushels. Cold summer.
† H. C. April 23 April 29 June 20–July 31 June 26 Aug. 9–Sept. 13 Sept. 15

1863. 44/9 Fine and dry summer, mostly hot. One of finest crops known, enormous produce of fine quality, 38¾d bushels. Another estimate, 17,000,000 qrs. grown. August temperature, 61.3 Wet June.
† H. C. April 19 April 16 June 29–July 25 June 20 Aug. 4–Sept. 3 Sept. 15

1864. 40/2 July 4 to August 21 severe drought; dry year, good harvest, began August 2, fine quality, 35⅛ bushels. Another estimate, 16,000,000 qrs.
† H. C. April 23 April 23 June 27–July 12 June 20 Aug. 5–19 Aug. 31
Cold spring, dry summer, little hay, no turnip harvest, except wheat not an average.

1865. 41/10 Great rain at times. Drought and heat August 27 to October 8. Harvest damaged by storms, began July 31. Estimate, 14,200,000 qrs.
† H. C. April 19 April 27 June 19–July 20 June 17 July 24–Aug. 30 —

1866. 49/11 Slow, showery harvest, began August 8, yield and condition middling, 25½ bushels. Rainfall, 29.4, Chiswick. Estimate, 12,600,000 qrs.
† H. C. April 17 April 26 June 24–July 2 June 20 July 24–Aug. 30 —

1867. 64/5 Yield deficient, quality inferior, promised well June and July, 21¼ bushels, began August 10. Estimated, 12,000,000 qrs. Bad French crop.
† H. C. April 20 April 22 June 26–July 5 June 22 — —
July 2 a deep snow, May 6 thermometer at noon in shade 83. Snow May 22 and 23; winter early, hard frost October 4 and 5.

1868. 63/9 May 2 to September 21, great drought and heat. Harvest began July 18, very bad hay crop, very large wheat crop. Estimated, 16,000,000 qrs.
† H. C. April 23 April 12 June 15–17 June 15 — —
Harvest finished July 27, few swallows this year, hot dry summer.

1869. 48/2 Large acreage. Estimates opposed.
†H. C. April 20 April 14 June 23–29 July 5 — —
First flight of swallows this year on August 8, then August 17, then September 10, all gone October 10.

1870. 46/10 Drought and much heat from middle of May to August 22. Fine, still blooming time, yield a full average. 14,800,000 qrs.
†H. C. April 14 April 26 June 23–24 July 16 — —
Very dry summer, remarkable for failure of hay crop, average one-third of a load per acre on March 13, this year a hard frost killed nearly all the robins.

1871. 56/8 Early harvest, but estimated only 10,500,000 qrs. Bad French crop, 78,000,000 hectolitres. August temperature, 64.6.
†H. C. April 16 April 20 June 26–July 8 — — —
Cold spring up to June 20, fine summer, very few robins to be seen this year or last.

1872. 57/0 June, July, September warm, August below mean. Short crop, 26½ bushels.
†H. C. April — — — — —

1873. 58/8 April, May, June below; July, August above mean temperature. Bad crop.

1874. 55/10 May, June, August below; July and September above mean temperature. Abundant harvest in United Kingdom, France, and generally.

1875. 45/2 February, March, April below; May, June, August above mean temperature. July, 3.5 below. Deficient harvest, 10,000,000 qrs. in United Kingdom, but well got. Cold and dry spring, floods in autumn. Heavy snow November, December. Average in France, 95,000,000 hectolitres.

1876. 46/2 Very hot summer. Easter snowy and very wintry, after wet autumn and cold, droughty spring. May dry, cold, and often very frosty first three weeks; afterwards fine and warm. June fine, but variable. Wheat bloomed very favourably fourth week. July very hot, 3 deg. above mean temperature. August first days wet, then intensely hot 6th to 23rd. On 13th mean heat 14½ deg. above average. Harvest period generally fair. Deficient harvest (the second), estimated variously at only 9,600,000 qrs. to 11,500,000 qrs., quality good, and mainly very superior and in finest condition. Total yield very disappointing. Returns to *Agricultural Gazette*, 119 average, 36 above, 117 below average. Breadth under cultivation very small. Barley, beans, and oats all under average. Later estimates of Wheat harvest, 10,500,000 qrs. French harvest nearly an average.

1877. 56/9 Deficient harvest (the third). Quality of the grain very inferior. Autumn and winter seed time favourable, acreage increased. January and February mild and rainy. March variable and colder than February. April harsh and unseasonable. May cold and ungenial up to Whitsuntide; fair afterwards. Wheat plant reckoned a fortnight late, and often of a bad colour.

1878. 46/5 An average harvest south, over an average harvest north, s. the Tweed. Crop much deteriorated by rains in mid-harvest. Estimated yield, 12,000,000 qr.

1879. / Greatly deficient yield of all agricultural produce through a continuously wet and cold season, that neither allowed grain or roots to mature properly, or to be harvested favourably. The wheat yield reckoned only six-tenths of an average per acre. See special reports elsewhere on the harvest and weather.

ANNALS OF AGRICULTURE,

YEAR 1879.

THE SEASON in its persistent badness has never been paralleled in the last half-century, and records back to 1816 have had to be searched for a like period. This we give below. Perhaps 1845 and 1860 are the two other years that nearest agree with 1879, but in those seasons the corn yield was better than in this—five-eighths of a crop is the worst we have ever heard of, and this year's six-tenths deficiency constitutes 1879 one of the two worst *Farmers' years* of the century.

A writer in the *Globe* makes the following remarks, suggested by Mr Walpole's "History of England":—

> If the year 1879 was remarkable for nothing but the universal failure of agricultural products, it would not be easy to find a parallel; but when, in addition to this failure, we turn to the depression of trade in all its branches, it is difficult, indeed, to name a year conspicuous for a similar combination of misfortunes. Such a year, however, the country experienced in 1816—the year, be it remembered, after the battle of Waterloo and the cessation of war; the period usually regarded as one of peace and plenty, reviving trade, and returning prosperity. Far otherwise was it in reality. "The fall in the value of corn," writes Mr Walpole in his "History of England from 1815," "deprived the farmers of all probability of profit; and farms in every part of England were thrown out of cultivation." Then, as now, recourse was had to a reduction of rent on a large scale. "The average of these reductions," contines Mr Walpole, "amounted to 25 per cent.; and, placing the rent of land at £36,000,000 a year, the Board of Agriculture, in consequence, inferred that the loss occasioned by the distress, to landlords alone, amounted to no less than £9,000,000 a year." The manufacturers fared no better than the farmers. "English goods"—we quote from the same authority—"were selling for much less in Holland and in the north of Europe than in London or Manchester. Manufacturing operations were consequently paralysed." Large numbers of workmen were thus deprived of employment and thrown on the rates, and their numbers were greatly increased by the extensive reductions in the naval and military establishments, rendered necessary by the conclusion of the war. "The number of bankruptcies," said Broug [illegible] House of Commons, "is daily incr [illegible] trade is at a standstill; the landlord receives no rent; the tenant can sell no corn." As in 1879, so in 1816, rain and cold prevailed through the summer months. "News," says Mr Walpole, "arrived from every part of Europe, excepting Russia, of disastrous inundations. . . . A severe frost in September killed all the vegetables in the neighbourhood of Ely. The harvest everywhere failed. . . . the price of wheat rapidly rose, till in December it averaged nearly double the sum at which it had been quoted in January." . . . "The distress in Yorkshire," quoted Lord Darlington to Lord Sidmouth, "was unprecedented. There was a total stagnation of the little trade they had. Wheat was already more than a guinea a bushel, and no old corn in store. The potato crop had failed. The harvest (October 8) was only beginning, the corn in many parts being still green; and he feared a total defalcation of all grain that season, from the deluge of rain which had fallen for many weeks, and was still falling. . . . . The price of iron had fallen from £20 to £8 a ton, and the most serious distress resulted in consequence, both in the iron trade itself and in the coal trade, which is dependent on the demand for iron." Many furnaces ceased work, and a large number of workmen were in consequence thrown out of work. "The manufacturing poor were reduced literally to starvation. Men were compelled to eat the cabbage stalks in their cottage gardens to save them from starving. . . . . 27,500 persons, out of a population of 84,000, were in receipt of relief in Birmingham." We have quoted at length from Mr Walpole's History in order to show how aptly much of his description of 1816 applies to the present year. We do not, indeed, anticipate such dire distress as prevailed at that time, but we cannot look forward to the winter without misgiving. The increased facilities of trade and commerce will, we trust, maintain the necessary articles of food at moderate prices. Satisfactory as this will be to the consumer, it will be but poor consolation to the farmer, who in former times could find comfort—a selfish comfort, perhaps, but still a very substantial one—in the fact that in bad harvests his produce would command high prices. It is earnestly to be hoped that as in 1816 so in the present year, distress will be followed by an abundant harvest and a reviving trade.

Weather and Markets.

FOR THE CEREAL YEAR OCTOBER 1878 *TO SEPTEMBER* 1879.

OCTOBER.

October 1878 was quiet and mild up to the 6th, when the day was as warm and genial as in August. From the 6th to the 11th was a windy period, but not bad weather on the whole. The 12th and 13th brought a great change in the temperature, and the first touch of winter was seen upon the flowers and leaves. From the 15th to the 20th the days were alternately still hazy and overcast, and windy and gloomy. From the 21st to the 26th inclusive, very unsettled weather prevailed, serious gales passing and repassing over the British Isles; these windstorms, however, were not attended by much rain. Indeed most of the moisture of the month came in squalls rather than regular rainfall. On the 25th the wind, previously westerly, veered to the north, and to the end of the month was a harsh, cold, ungenial period; snow fell, hail storms visited several localities, and there was much electrical disturbance.

Barometer, highest, 30.32 deg. on the 13th; lowest, 29.08 deg. on the 22nd; 29.04 deg. on the 26th.

Thermometer, highest in sun, 75 deg. on the 5th; in shade, 64 deg. on the 6th; lowest, 35 deg. on the 30th. There were some frosts on the 12th, 13th, 14th, 27th, 28th, 29th, 30th, and 31st inst.

The mean temperature of October was 51.5 deg., being 1.9 deg. above the average. It was 2.9 deg. higher than in 1877, though 1.3 deg. lower than in 1876.

Rainfall: Total fall was 1.25 inch on thirteen days, or 1.59 inch less than the average for October. Greatest fall in one day was 0.30 inch on 26th.

Farmers who were more than usually early with their sowings did fairly well, but the time was bad for field operations at the end of the month. Threshing proceeded very actively.

MARKETS.—After a long depression both in demand and price, the wheat trade revived a little, the English average being only 39s. The beginning and end of harvest being favoured with fine weather, supplies came in with moderate freedom, but the quality was often exceedingly inferior. America sent from Atlantic ports 521,500 qrs. wheat, and California 180,000 qrs. in the past four weeks. The quantity afloat, 1,300,000 qrs., did not increase during October, and granary stocks were estimated smaller than they were a year ago. The Continent continued importing heavily from America and Russia, so as to distance completely English purchases. The English wheat supplies for four weeks were estimated 968,260 qrs., those from abroad 1,149,376 qrs., or about 400,000 qrs. in excess of supposed requirements. Autumn field work and seeding made a good start, under fine but cold weather.

NOVEMBER.

November 1877 was an extremely gloomy month, wintry and chill from the beginning, and steadily progressing in damp and cold throughout its course. The middle of the month was very wet, and after five finer days, from the 19th to the 23rd inclusive, another rainy period set in and continued until the end of the month. Winds were high, and made the low temperature much less easily bearable than would have been the case in still weather. The 8th and 10th were the stormiest periods.

Barometer, highest, 30.48 on the 19th; lowest, 29.20 on the 15th. Range, 1.28 inch. Greatest changes in 24 hours, from 30.21 to 29.23 on the 9th and 10th, fall with south-westerly gale, and from 29.80 to 30.48 change from rain to fair, and cold weather on the 18th and 19th.

Thermometer, highest 53. on the 25th, lowest 29. on the 3rd. There were ground frosts on the 2nd, 3rd, to the 8th, 12th, 19th, 20th, 21st, 22nd, 23rd, 27th, 28th, 29th, and 30th insts.

The mean temperature for November was 39.7 being considerably under the average. The years 1862 and 1871 had colder Novembers, but 1860, 1861, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1872, 1873, 1874, 1875, 1876, and 1877, were all warmer as regards this month.

Rainfall was 3.46 inch or nearly an inch above the mean. Rain fell on seventeen days, on six days consecutively in the middle of the month, and on five days consecutively at the end of the month. On the 18th .0.86 inch of rain fell.

The month was unfavourable alike to threshing and to field work.

MARKETS.—The markets retrograded somewhat, to become firm afterwards, although lacking in strength. The fluctuations upwards in price failed to be continuous. The American cable still advised heavy weekly shipments of wheat—975,000 qrs. in four weeks to United Kingdom, and from Atlantic and Pacific ports nearly 600,000 qrs. of red wheat to the Continent. On the 30th English wheat averaged 41s. 2d. per qr., American red 44s., Californian 47s., Russian 40s. The Continental term markets offered contracts over several months at about the present low terms, thus opposing future improvement in value. The season was rigorous and often too wet for farm work. The English wheat supplies of four weeks were 865,000 qrs.; foreign, 935,704 qrs., or just about enough for consumption. Very cheap potatoe, abundant forage, and full supplies of oats and maize kept cattle food very cheap. The agricultural labourers' question drew attention to the state of farming prospects, which kept very gloomy.

DECEMBER.

December 1877 began with cold, and on the 6th the weather increased in harshness; severe frosts set in, and very low temperatures without intermission continued until Christmas night, when there was a remarkable and sudden thaw, and from the 26th to the end of the month the weather was comparatively mild. The average deficiency of daily temperature for the sixty-five days ending December 25 was 5.6 deg.: thus the autumn of 1878 was extremely harsh and rather winter may be said to have commenced a full seven weeks before its calendarial date —December 22.

The mean **temperature** of December was 33.7 deg., or about 6 deg. below the average. There were twenty-five frosts. Since the beginning of the century seventy-three Decembers have been warmer, only four colder, and one as cold. These five exceptionally wintry Decembers were 1840, 1844, 1846, 1870, and 1874. The curious will observe these recurrences after cycles of thirty years. December 24 was intensely cold, 17.5 deg. below the average, and the country had full opportunities of testing all the advantages supposed to accompany a "seasonable" Christmas.

The **rainfall** of December was 1.2 inch, or nearly 1 inch short of the month's average.

MARKETS.—December was a very wintry month, and the cultivation of the land at home and in France got decidedly in arrear; but the ports usually closed by ice kept open longer than usual, and the severity of frost and snow fell rather on southern than northern latitudes. The month reduced prices instead of advancing them, as expected, and English wheat fell back below 40s. per qr. The final estimates of the American wheat crop maintained the first guesses of an available surplus of 20 million qrs. of all sorts, and while shipments went on still briskly weekly, the "visible supply" reached the unparalleled bulk of 2,500,000 qrs., against about half that quantity held a year ago, and from which the January to March shipments could draw 100,000 qrs. to 150,000 qrs. weekly. The Continent continued buying largely, taking since harvest from Atlantic ports 10,000,000 cwt. over the bulk taken by the United Kingdom. The last four weeks' supplies were—from abroad, about 732,000 qrs.; from farmers, 892,000 qrs. The estimated granary stocks in most of the ports proved nearly half less than the bulk held in January 1878. The comparison with prices is as follows:—

	English wheat.	American.	Russian.	Californian.
January 1878	51s. 9d.	51s. 0d.	53s. 0d.	62s. 0d.
January 1879	39s. 9d.	43s. 0d.	40s. 6d.	48s. 0d.

JANUARY.

The weather of the month was remarkable for variety, though a harsh character was with one short break maintained throughout. At the beginning of the month a westerly wind prevailed, and compared with December the weather was milder. From the 1st to the 4th the days however were wet and unsettled, then came seven cold dull days, culminating in the intense cold of the 12th. On the evening of this day a south-westerly gale broke up the frost. Three unsettled days followed, during which the warm atmospheric wave exhausted itself. On the 16th the wind reshifted to the east, and great cold set in, continuing until the close of the month. The east wind at the end of the month caused a rise in the barometer, but the south-west gale of 13th was not marked by any great fall. The month was distinguished by little sunshine, and the temperature of noon and midnight was not greatly different.

Barometer, highest 30.44 deg. on the 27th, lowest 29.32 deg. on the 3rd; range, 1.12 inch. Greatest gradient in twenty-four hours, 30.16 deg. to 29.32 deg., 2nd to 3rd inst.

Temperature, highest,.51 deg. on 1st; lowest,.18 deg. on 12th; range, .33 deg. Frosts on 2nd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st inst.

Rainfall, 2.80 deg. or 0.17 deg. over the average. The wet days were the 1st, 2nd, 3rd, 14th, and 18th. The month to non-scientific observers seemed a dry one, but the snow and sleet of the first three days alone contributed 1.89 deg. to the total rainfall.

MARKETS.—The Corn Trade was dull and discouraging, although the state of affairs was not one calculated to weaken the position of holders, for frost continued throughout the month without any serious break. Bleak winds impoverished the wheat plant. The wheat exports of the United States were but 90,000 qrs. weekly from Atlantic ports, and California sent but very small shipments. Already the expectations of the American wheat area and crop being again enormous disheartened European trade. The exports of 1878—Atlantic ports, 10,973,750 qrs.; California, 1,312,500 qrs.; total, 12,286,250 qrs.; and flour equal to 2,705,312 qrs.—altogether over *fifteen millions* of breadstuffs—were on a scale that created astonishment, which was increased by the fact of the Continent taking a larger share than did the United Kingdom. The export of flour in bags, instead of barrels, had a decided influence on the English trade. Navigation in the Baltic, on the Danube, and at Odessa was almost entirely closed. The weekly supplies of January were as follows:—

	English	Foreign	Total
Jan. 4	151,568	217,063	368,831
" 11	149,604	207,310	356,914
" 18	208,564	314,665	523,229
" 25	223,168	191,912	414,680

The quantity of wheat on passage diminished from about 1,700,000 qrs. to 1,367,000 qrs. The English average price was:—

39/7 ...... 39/7 ...... 38/11 ...... 39/1

FEBRUARY.

February 1879 was a very wet, harsh, and stormy month. The dull cold of January was continued on the 1st, 2nd, 3rd, and 4th inst. On Candlemas Day there was a cold thaw during midday hours. From the 6th to the 11th the weather was wet and comparatively warm, but from the 12th to the 24th here was a steady movement from mildness to intense cold. On the 25th and 26th the wind was northerly, but a change at the end of the month occurred. February closed with a S.W. wind, with the rising thermometer and falling barometer that usually accompany the warm air currents.

Barometer, highest, 30.18 on the 1st; lowest, 28.82 on the 10th; range, 1.36 inch. There was a sharp rise from 28.82 on the 10th to 29.93 on the 13th.

Thermometer, highest, 53 on the 8th and 9th; lowest, 22 on the 24th; range, 31. Frosts occurred on the 1st, 2nd, 3rd, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, and 27th inst.

Rainfall was heavy. Either snow or sleet or rain fell on twenty-three days and the month's total, 4.01 inch, was 2.43 inch above the average. Snow storms occurred on the 3rd, 20th, 21st, 25th, and 27th inst.

MARKETS.—In this month English wheat competed with and undersold foreign sorts: 504 lbs. of native wheat for 37/7 distanced rival imports. Californian was obtainable at 45/. The weekly deliveries were good, and furnished evidence of an average crop having been grown. The coldness of February—most extreme in the last fortnight—often snow and much frost, kept the growing crops backward as well as spring seeding, but was favourable to the condition of grain. The news of the American growing wheat was satisfactory, as it also was of the advancing crop in Egypt. London value was neither the highest nor the lowest in the European wheat markets, Vienna and St. Petersburg being lowest, Spain and Italy the top. The French rates ran parallel with English, only were 3/ and 5/ higher. The month's supplies were, in qrs.:—

	English	Foreign	Total
Feb. 1	223,336	183,511	406,847
,, 8	254,952	214,000	468,952
,, 15	248,956	237,492	486,448
,, 22	226,200	229,120	455,320

which fairly kept the current wants of the country furnished, a fact that might easily have allowed higher prices to rule. The averages were:—

38/4 ...... 38/1 ...... 38/1 ...... 37/7

Maize, too, was very cheap—23/ to 24/ per 480 lbs.

MARCH.

March was a dry month, at the same time there occurred several sudden weather changes. The month opened with northerly winds and a very low temperature, but the 2nd saw a great thaw, 22 deg. rise in nine hours. South-west winds prevailed from the 3rd to the 9th, the weather being mild and fair. Sunday, the 9th, was a bright, sunny, balmy day, and the first butterflies of the season were seen. The thermometer stood at 63 deg. On the 13th the wind reverted to the north, snow and sleet accompanying the change. The 15th witnessed a sudden change to mild weather, and up to the 19th the air was quite warm. The 20th was marked by reaction to cold, and the 24th, 25th, and 26th were extremely harsh days, sleet falling with cutting wind. By the 29th, however, the warmer currents had once again obtained prevalence, and the month went out with a mild air and some rain. The old proverb, about March coming in like a lion and going out like a lamb, was fairly exemplified.

Barometer, highest, 30.62 deg. on the 8th; lowest, 29.57 deg. on the 27th; range, 1.05 deg. On the whole the barometer was higher than usual. Despite the sudden wind change, gradients were not steep.

Thermometer, highest, 63 deg. on the 9th, and 64 deg. on the 19th; lowest, 28 deg. on Candlemas morning; range, 36 deg. Frosts occurred on the 2nd, 8th, 13th, 14th, 22nd, 23rd, 24th, 25th, 26th, 27th, and 28th inst.

Rainfall did not amount to more than 0.87 inch, or only about one-third of the average fall.

MARKETS.—In this month English wheat rose 2/8 per qr., each week being as follows:—

38/ ...... 39/1 ...... 39/7 ...... 40/8 ...... 40/8

Some of this advance was owing to the improved condition of the grain, but otherwise value hardened after an ungenial winter, that alike starved stock, afflicted the human race, and crippled trade. Northerly and easterly winds produced some March dust, but all Nature was backward, and Barley had to be substituted for Wheat. The farmers' deliveries kept large, contrary to expectation. Californian Wheat made but 45/, Australian 48/, fine Dantzic 50/; Indian Wheat was offered at 42/6, Taganrog and No. 3 American Wheat were but 35/ to 38/, and the finest red Wheat in the market was but 46/. Standard London Flour—the best—was 40/, and Eastern Counties Flour made but 27/ to 28/. More extraordinary was the price of barrel Flour, which fell to 17/, and Canadian barrel sorts were but 21/ or 30/ per sack. The American Atlantic shipments during March were about 450,000 qrs. Wheat, 275,000 qrs. as Flour to the United Kingdom, and 600,000 qrs. to the Continent. The total month's supply—five weeks—were:—

	English	Foreign	Total
March 1	182,300	151,500	333,800
,, 8	177,964	271,624	440,588
,, 15	207,326	220,037	427,363
,, 22	201,364	214,482	415,846
,, 29	168,924	169,500	338,424

Granary stocks were moderate.

APRIL.

The weather during the month of April was damp, cold, and ungenial. The month opened with SW winds, showery weather, and low temperature. From the 5th to the 9th it was not so cold, the eighth being a comparatively warm day. A decided change took place on the 9th, when the wind shifted to the north, and temperature fell quickly. From the 10th to the 22nd was a very cold, bleak, and desolate period, and Eastertide, although late, was miserable and unspringlike in character. Good Friday was frosty, and sleet fell. Holy Saturday was a day of snow and cold. Easter Day was finer, but not bright. Easter Monday was a dull, cold day. The 23rd, 24th, 25th, and 26th were fair days, and not cold, but harsh weather returned on the 27th, and prevailed until the end of the month.

Barometer, highest, 30.31 on the 29th; lowest, 28.95, on the 7th; range, 1.36 inch.

Thermometer, highest, 62 on the 26th; lowest, 29 on the 12th; range, 33. On the 12th there was a grass frost of 14 deg. There also were frosts on the 3rd, 11th, 13th, and 14th inst.

Rainfall, 2.76 inch, being considerably over the average. Rain fell on 19 days. The wettest days were the 7th, 10th, 12th, 16th, and 20th inst.

The 12th of April was one of the worst days of the whole year; piercing cold, and driving sleet.

MARKETS.—Value kept at a standstill. The English Wheat averages were:—

40/11 ...... 41/ ...... 41/2 ...... 40/11

Eastertide was gloomy, agriculture, trade, and future prospects being ungenial as the season. Spring sowings were continually interrupted, and the growing plant was in a very unsatisfactory plight, at home and in France. Fears as to the future harvest already gave steadiness to the markets. The Flour trade was especially depressed. Freights were exceedingly low. The American shipments in four weeks were: 454,500 qrs. Wheat to this country; 380,000 qrs. to the Continent; and the United Kingdom got 170,000 qrs. Wheat from California, besides 221,000 barrels of Flour from Atlantic ports. The French bought some cargoes off our ports of call. India scarcely escaped scarcity, and had no surplus to export. Australia and Chili shipped freely in April. The month's supply was, in qrs.:—

	English	Foreign	Total
April 5	175,424	320,000	495,424
,, 12	211,756	207,100	418,856
,, 19	190,564	301,600	492,164
,, 26	213,932	361,500	575,432

Country millers began to recover confidence, so as not to press sales.

MAY.

Harsh winds and cold rain are never welcome, but in no month are they more unseasonable than in "flowery" May. During the course of this ungenial month the fields fell seriously into arrear; in fact, there appeared on the 30th hardly anything to show for four weeks' advance towards summer. From the 1st to the 19th the temperature remained unusually low. The 20th, 21st, 22nd, 23rd, and 24th were warmer, but the end of the month was both cold and wet. The variations in the **barometer** were very frequent, but gradients were moderate. The highest, 30.52, was on the 4th; the lowest, 29.58, was on the 27th.

Thermometer, highest, 68 on the 20th; lowest, 30, on the 4th; range, 38. Nine degrees of frost occurred on the night of the 4th, 7 deg. on the 10th, and there were besides night frosts on the 1st, 2nd, 3rd, 7th, and 8th inst.

Rainfall was excessive, 3.39 inch. Seventeen days were wet. On the night of Wednesday, the 28th, a violent thunderstorm passed over London, accompanied by an almost tropical downpour of rain; the amount measured between 8 P.M. on the 28th and 3 A.M. on the 29th, being as much as 1.64 inch.

In spite of the month's general character, "Queen's weather" marked the 24th, which was the finest and brightest day of the whole thirty.

MARKETS.—English Wheat did but gain about 1/ in price through a most ungenial May. The averages were:—

40/9 ...... 40/9 ...... 40/8 ...... 41/4

for there were 1½ million qrs. of Wheat on passage. Flour sold at 28/ for Norfolks, 32/ for London Households, and 40/ for the top-price Standard Flour. Whitsuntide was as cheerless as Easter, and farm lands were falling still in value, since farmers looked aghast at the prospect of another bad year. Everything was backward. All North-West Europe was complaining of winds, floods, and absence of sunshine. Sunny Italy was as badly off as the Hebrides. One had to cross the Atlantic to hear "glad tidings" of the fields, and there fine promises whipped forward stocks and made large shipments—about 950,000 qrs., Wheat being despatched in almost equal proportions to the United Kingdom and Continent. California gave us 100,000 qrs., and 111,000 barrels of Flour were shipped in four weeks. The visible supply available for fresh exports was exceedingly large. The four weeks' supply was still well made up by farmers:—

English	Foreign	Total
909,162	882,958	1,792,120

As in previous months, the markets in May were dull from the absence of all speculation.

JUNE.

The month was a very unseasonable one. The temperature was low, and there was a remarkable want of sunshine. The rainy days were excessively numerous and the skies seemed to be continually overcast. The crops, already a full fortnight late, lost still more ground, and at Midsummer it was confidently affirmed that almost a miracle would be needed to give the country average wheat crops. There were no frosts, but this hardly atoned for the low day temperature even in the case of gardens and vegetable cultivation. The wind kept almost uniformly in the rainy quarters, and towards the end of the month became rather boisterous, with a good deal of electric disturbance and constant squalls of rain.

Barometer, highest, 30.16 on the 13th; lowest, 29.41 on the 3rd; range, 0.75 inch. The glass was unsteady, but there were no steep gradients.

Thermometer, highest, 71 on the 5th and 28th; lowest, 41 on the 4th; range, 30.

Rain fell on twenty-one days, and the months total, 4.31 inch, was largely in excess of the average for the month. The wettest days were the 2nd, 7th, 15th, 16th, 21st, 24th, 25th, and 26th inst.

MARKETS.—A bad May and a wet June: several floods occurring in the last fortnight, and a very low temperature, reduced harvest prospects materially. At Midsummer many wheat fields were not in ear, but still the markets remained dull and prices very low. A late gathering at home and abroad became certain, so that an extra month's imports would be necessary; yet this fact, and a knowledge that the crops must be deficient, were not enough to create activity in our exchanges. The early Southern States of America secured good crops, and in the Northern and Western States prospects kept good. Already offers for shipment of the new Californian wheat were made at 45/, and of American winter and spring 37/ to 43/. This precipitate action on the part of New York and Californian merchants oppressed business, and flattened down value. The supplies of June were, in qrs., about—

English.	Foreign.	Total.
753,704	1,116,096	1,869,800

The Atlantic shipments in four weeks were, of wheat—

To U.K.	To Cont.	Flour to U.K.
489,500	540,000	195,000 brls.

and there were 1½ million qrs. of wheat on passage. Stocks kept low, and all arrivals were absorbed. The hay harvest was greatly spoiled by rainy weather, and most meadows were allowed to grow on a month or six weeks later than usual. Flour all throughout June was neglected even more than wheat, which ranged from 41/7, 41/4, 41/8, to 42/6 on the 28th.

JULY.

The dreariness and disappointment of June were almost forgotten in the disaster of July. The heavy rains of the first week, which deprived London of a fine exhibition and cost the Royal Agricultural Society £13,000 out of pocket, will long be remembered, and a July in which from the 1st to the 22nd there were only three fair days, certainly has but few precedents in the annals of English meteorology.

There were eight fine days at the end of the month, but the 31st was marked by a slight rainfall and by electrical disturbance.

The aspects of the fields became deplorable. The barley crop suffered even more than wheat, and at the end of the month hardly a yellow tinge was observable upon the growing corn.

Barometer, highest, 30.18 on the 28th; lowest, 29.32 on the 20th; range, 0.86 inch. The gradients were not steep.

Thermometer, highest, 80 on the 29th and 30th; lowest, 47 on the night of the 27th.

Rain fell on twenty-two days, and the month's fall, 4.04 inch, greatly exceeded the customary average of July. The wettest days were the 1st, 2nd, 3rd, and 20th inst. Thunder was frequently heard.

MARKETS.—Prospects darkened. The summer was without sunshine, and Austro-Hungary, Italy, and other early districts found the yield of wheat decidedly deficient. In Milan a qr. of wheat was worth 52/, or about 10/ over English rates. Russian prospects were fair, but uncertain, and now, besides the U.K., that country has many other customers which buy more than half the surplus. America was jubilant over a good crop, and pressed it forward eagerly. The total supplies expected was announced as 20 to 24 millions qrs.! All through the summer the American visible supply kept very heavy, twice the usual quantity. On July 1 wheat was 41/, on the 31st 39/, in New York. The shipments were, in four weeks, to U.K.:— Wheat, 892,000 qrs., 172,500 brls.; to Cont. only 330,000 qrs. wheat.

The current total receipts of the U.K. were, in four weeks :—

English.	Foreign.	Total Qrs.
416,098	1,140,398	1,556,496

Farmers' stocks appeared exhausted, and dwindled weekly. Harvest was not expected to be general until September. These circumstances caused wheat to rise from 42/4, 43/4, 44/10, to 47/7.

Rain on 22 days, and in amount over 4 inches, settled the future, and left August the impossible task of making a harvest.

AUGUST.

The weather during the first few days, though warm, was extremely unsettled, and rain fell almost every day until the 8th. This date saw an improvement in the prospects of the long enduring farmer, and up to the 16th we were able to feel that the "ardent August" of old times was not completely lost to us. Rain fell rather heavily from the 17th to the 21st, then came three fine days, and then again five days of rain, with which the month was brought to an unsatisfactory close. St. Bartholomew, the 24th, was fine, thus giving a presage of a genial autumn. Harvest did not really begin till about the 18th inst., and we saw hay in one of the southern countries, still out on the last day of the month. The delay in hay harvest did serious injury to what otherwise would have been a good crop.

Barometer, highest, 30.14 deg. on the 2nd, lowest, 29.47 deg. on the 17th and 27th; range; 0.67 inch. The month's gradients were not steep.

Thermometer, highest, 79 deg. on the 13th; lowest, 46 deg. on the 18th; range, 33. On the 14th the glass stood at 76 deg.; on the 15th at 77 deg. It is a curious fact, that within the past decade August 13 has been almost always either the hottest, or one of the hottest, days of the year.

Rain fell on eighteen days. The month's rainfall, 5.24 inch, was enormous; more than 8 inches over the mean. The 23rd was extremely wet, 1.27 inch fall. Other very wet days were the 6th, 17th, 20th, 26th, 27th, and 28th inst. During the last fortnight of the month much more rain fell in the east and south-east then in the west—usually the wettest part of England.

MARKETS.—The price of wheat was carried still higher: from 47/7 at the end of July, to 49/3, 49/7, 49/5, 49/, and 30/ back to 48/. Part of the month was hot and favourable, but still the rainfall was excessive and disastrously heavy on some days. Great breadths of corn lands were under water!

The American spring wheat was harvested early in this month, and the quality of both winter and spring is found to be excellent. Minnesota reports an average yield of 12.6 bushels per acre.

The crop returns of the U.K. collected by the *Agricultural Gazette* compared unfavourably, as expected this season, with the worst recorded previously. Out of 100 returns the deficient estimates are of wheat 75, barley 61, beans 65, peas 66, oats 23, and the potato crop was known to be diseased past recovery. The hay harvest still dragged on.

August 1879 was the wettest, worst, and coldest of the present generation, and unripened grain rotted in our fields. In France the weather was better, but all the crops gathered—late there as here—were deficient, wheat especially. Germany claimed to have an average harvest as in 1878: an estimate to be doubted.

The supplies of four weeks were, in August, English, 286,100 qrs.; foreign, 1,337,820 qrs.; total, 1,623,920 qrs., or about the estimated four weeks' consumption of the nation. Considering the position of the whole English harvest, the markets of August remained very inanimate.

SEPTEMBER.

Although rather changeable, September was, on the whole, a fair month. The opening days were very bright and summerlike, though cold in the early morning; and up to the 11th inst. farmers had a good time for harvest operations. The ten first days of September constituted, indeed, the mid-harvest period of 1879. Rain fell rather heavily on the 12th, 13th, and 14th, but the weather afterwards cleared, and, with the exception of passing showers on the 17th and 18th, the second period of the month was fair. The 22nd, 23rd, and 24th were wet, the morning of the 24th being marked in particular by a very heavy downpour. The 25th, 26th, and 27th were really fine days, but the 28th was unsettled and showery, and the 29th was wet. The last day of the month was fine, the weather appeared to be becoming more settled again, and a genial October to be presaged.

Barometer, highest, 30.47 on the 1st; lowest, 29.29 on the 24th; range, 1.18 inch. Steepest gradient, from 29.29 on the 24th to 30.32 on the 26th inst.

Thermometer, highest, 74, on the 3rd; 39 on the 25th; range, 35. In some districts there was slight grass frost on the 1st and 25th inst.

Rainfall, 2.68 inches, on twelve days. Wettest days, 13th, 23rd, 24th, and 29th inst.

The Equinox was fine and calm. Prevailing wind, N.W. The prevailing winds of the month were S. and W.

Markets.—Value began to recede, notwithstanding the outcry from our harvest fields. The Americans were able, it was said, to overwhelm us with their abundance. The English price kept at 48/2, 47/11, 47/4, and fell to 46/5 on September 27. At the end of the month large tracts of country were uncleared of their crops, but the chief work of harvest had been accomplished. There was a wail of deficiency everywhere: wheat 2 qrs., barley 2 qrs. to 3 qrs., oats 4 qrs., peas 3 sacks per acre, potatoes not worth digging in many counties; hops 2 to 3 cwts. per acre. Fruit and roots alike a failure, save turnips on light soils. The French too called for 6 to 8 million qrs. Nevertheless, reliance was still placed on the American surplus. However, speculation started into life, and made immense contracts, and raised red winter wheat from 47/ to 82/6. Maize was put up 3/. Beans and peas, 2/. Flour, 3/ to 2/. The Continent bought more heavily than the U. K. of New York.

In five weeks the supplies received were :—

English	Foreign	Flour	Total Qrs.
301,508 ……	1,730,425 ……	230,500 ……	2,263,533

and stocks kept but moderate. The new deliveries of English wheat were the least ever recorded in September. The American shipments were immense from Atlantic ports :—

To U.K. Qrs.	To Cont. Qrs.
1,206,500	1,940,000

California sent 370,000 qrs. wheat, and 354,500 barrels of flour came also. These stupendous exports, however, failed to restrict speculation.

THE ENGLISH HARVEST, 1879.

Under ashen skies, that accord rather with men's present opinions than with their hopes, the harvest is dragging on a laborious course towards a conclusion that cannot be other than disappointing, and may not improbably prove disastrous in shortness of the quantity reaped and the poorness of the quality yielded. Sown amid the November storms that heralded the severest winter of the cycle, and nurtured through five months' dreary alternations of soaking rain and blighting frost, the English wheat fields at the beginning of summer stood in need of all that bright sunshine and genial skies could do, in order to bring them by mid-August to even an average yield. How anticipations have been disappointed by each successive summer month, and how from years of loss we have been brought throught wet and sunless days to accepted failure is a story too recent and too unpleasant to bear or require re-telling. The harvest of 1879 is deficient, perhaps, 30 per cent.

Prices, however, are not impelled upward by the realization of this natural calamity. Foreign corn is plentiful, and, being plentiful, is fairly cheap. Bread must be had by the people, who are not political economists, and who judge the question simply as the quartern loaf is ninepence, eightpence, sevenpence, or sixpence at their bakers.

The greatly reduced expenditure of 1878–9 on cereal produce equalled a reduction on taxation of the whole cost of the army or of the entire income tax plus 20 per cent. on the customs.

This valuable assistance will be lost with the new cereal year, which, according to all appearances, must expect to pay as much to foreigners for cereal produce as did the bad year 1877-8. Prices on the average may possibly prove a little lower than in that year, but even *more grain would seem likely to be* required.

The complaints of this year's harvest have become so loud and so general that the markets have at last been compelled to lend an unwilling ear, and prices during the past week have, staple for staple and quality for quality, been the subject of a fractional improvement. Whether the improving tendency will continue seems to depend, to a great extent, on the American shipments, but at the present level of transatlantic supplies, advance does seem, on the whole, more probable than decline. The improvement will be of no great benefit to the farmer, whose poor grain will be offered for sale in vain to millers with a choice of corn of finer quality and in better condition, from half a dozen foreign lands. Old English wheat may go up in price, but of this there probably does not remain in farmers' hands more than a fortnight's supply all over England.

The unsatisfactory state of the new wheat brought to market is very discouraging. Weight is everywhere deficient. About 60 lbs. appears to be the average; 61 lbs. is fairly and 62 lbs. very good. The quality is very irregular, but there is no disguising the fact that so far the samples have shown a serious preponderance of the most inferior grades. Condition is the fault of the weather, which has not been absolutely unfavourable to the cutting of the corn, but has not at all helped its drying. The meteorological returns of recent weeks and months show an excessive rainfall in bare figures, but they cannot show how the effect of this excessive rainfall has been increased through the overcast skies, the low temperature, and the remarkable absence of evaporation. There is a moderate abundance of labour this season, and many farmers are cutting two and even three cereals at one and the same time.

Dampness lingers among the sheaves in the fields, and those farmers have done best who have cut and carried their grain, the one operation as close upon the other as possible. What the crops are that are being reaped and carried becomes daily more and more plain. There are a good many fine fields of oats—perhaps one in three. There are very few fine fields of wheat or barley—perhaps one in twenty. Portions of most wheat fields are blighted or sterile, or devoured by vermin. The lowest and richest lands have suffered most, but fields on dry and chalky soils have not escaped the blight. The straw is generally weak, and, notwithstanding the wet season, is seldom high. Malting barley will be even more scarce this than it was last year. Colour and quality are alike spoilt in the majority of cases. Beans are a very irregular crop, peas a partial failure, especially in the home districts. Hops are frequently not worth picking, and potatoes are rotten and diseased. Such is the power to blight and ruin of continual rainy weather, *combined with dull skies and a cool air.* Even roots are not doing well.—*From* The Farmer, *September* 18, 1879.

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THE HARVEST.

(Continued from p. 63.)

[FROM J. AND C. STURGE'S CORN CIRCULAR.]

Birmingham, September 25.—We have delayed reporting upon the harvest a month longer than usual, and even now we are unable to learn very definitely the result, but from the reports of our correspondents annexed, the present crop of wheat appears to be the worst for the last half century. Though this is the third deficient crop in this country, yet in consequence of the large supplies from America prices have barely risen to 10s. per qr. above the low rates current at the beginning of the year, which were the lowest for the last twenty years.

Glasgow, September 19.—There will be little wheat ready for reaping for a week or so, and the crop is likely to turn out very poor in quality and deficient in quantity, probably not over two-thirds of an average. The cutting of barley and oats has commenced; the quality of the former crop depends very much on a continuance of the present bright weather; the quantity may prove to be nearly an average. Oats are the best crop, but in late districts it is feared they will not fill well.

Leith, September 19.—Our crops are likely to give a poor result this year and a great variety in quality. All kinds of grain will show but little of the best. Barley and oats will probably give the best return, and a fair quantity of the former has been cut, also a few early oats, but wheat is still very backward, and some of it in the north will probably never ripen. Potatoes are much complained of.

Berwick-on-Tweed, September 20.—Everything is so late here that no definite opinion can be formed of the state of the crops. Barley and oats cut up bulky enough, but the quantity will vary and the yield be small. Wheat cannot be more than three-parts of an average in yield, and is inferior in quality. Turnips about half a crop. Beans almost a failure, and potatoes short in quantity and only plentiful in disease.

Carlisle, September 19.—Harvesting has now become general, but we fear the result will show a much greater deficiency in wheat than for many years back, both as regards yield and quality. Barley and oats have also suffered much from the weather.

Greenhammerton, Yorkshire, September 23.—In consequence of the heavy rains and want of sun all corn crops will be far below an average, as, for instance, wheat, although somewhat promising on the drier soils a fortnight ago, is now much injured by mildew. Barley is abundant in straw, but is much damaged by being laid. Oats are deficient owing to the lower grains on the ears not having set. On the heavier soils many of the crops will be only half an average, and some even will hardly be worth harvesting.

York, September 20.—We incline to think, as compared with other districts, Yorkshire is not suffering so much as the south. Oats we do not hear very much complaint about. Barley is not quite so good a yield as oats. Wheat is much lighter, especially in corn, but there is generally an abundance of straw.

Nottingham, September 24.—In this district generally, up to cutting, all crops were erect, which fact, considering the weight of rain we have had, means a certain deficiency in yield. New wheat to market here as yet is raw and unfit for grinding. Barley varies: some, got well, comes to hand a fair quality off light land. I think there will be much more of poor quality. Oats are the better crop; some come to market fine and in good condition. Beans vary much, we hear of good crops of well-farmed light soil; on flat and low lands, beans look bad, weeds are abundant and the beans thin.

Peterborough, September 23.—In this district wheat is very deficient in quality and yield, many farmers quoting two quarters to five sacks as the utmost yield, weighing fifty-six to fifty-eight pounds per bushel. Barley: there are a good many fair crops in quality and quantity, while some are very deficient in both. Oats are our best crop, being a fair quality, but the yield is by no means good. Beans a middling and peas a very failing crop. Potatoes generally much diseased, and it is feared very serious losses will be felt by many growers.

King's Lynn, Norfolk, September 23.—In this district I do not think above two-thirds of the wheat is safely housed, some quantity even not yet cut; the result of thrashing the little already brought to market is most disastrous, 2 qrs. and 2½ qrs. per acre in lieu of 4 to 4½ qrs., and the quality generally very inferior. Barley is a somewhat better crop, but still considerably below an average; quality however is better than for some years past, as we have generally suffered from premature ripening, whereas this season, on the contrary, delay in ripening is the complaint, but we have secured a fair quantity of good malting quality. Oats are the best crop of the season. Beans almost and peas quite a failure.

St. Ives, Hunts, September 20.—Nearly all the wheat is cut, but still in the fields, and it requires a long exposure to make it fit for thrashing; that in the stacks must remain there for months. I have seen a few samples of fen wheats and very lamentable stuff it is; further on surely we shall improve on that. People are thrashing barley freely out of the fields, but here, as with wheat, the portion secured has been much hurried, and a great many stacks have already been taken to pieces again; much will be spoiled by heating. I have a very bad impression of the harvest.

Wellingborough, September 23.—Wheat crops in this neighbourhood, with but few exceptions, are light, and we do not expect will yield well; 3 qrs. will be good yield this season, the weather has been so wet, cold and uncongenial. Barley, as a rule, a light crop, and not more than half an average can be expected; some carried dry last week, not much thrashed yet; where it is threshed does not yield as expected. Spring beans are not yet fit to cut; most of the white corn cut, and not much carried in good order.

Northampton, September 24.—A small acreage of wheat, and, owing to the very wet season we have had, the quality will be very poor. The yield of that thrashed proved to be the worst experienced for many years, the average probably three to six sacks per acre. A larger acreage of barley, but owing to the season the quality will be generally poor, and the yield a deficient one, probably from two to eight sacks per acre. Oats an average acreage, quality good, the yield scarcely up the average. Beans and peas average acreage, yield a very deficient one.

Leicester, September 22.—A small breadth of wheat has been planted; it will prove very deficient in yield, and most of it very light in weight. Barley about an average on good barley-soil, but very short on the clays. Oats nearly an average. Beans may prove an average, with fine weather in October to gather them.

Leighton Buzzard, Bedfordshire, September 23.—In this district there has been so little thrashed that reliable information as to the yield is impossible. Our opinion is that on the average wheat will yield about 2½ qrs.; rivetts, 3½ to 4 qrs.; barley, 2 to 3 qrs.; oats, 5 to 7 qrs.; beans a few very good, but the larger part very deficient. Some have been sold by auction, at less than 2s. 6d. per acre, and there are a few crops that bid fair to turn out well.

Shropshire, September 23.—Wheat, it is to be feared, will be found from 20 to 25 per cent. below the average; some having been already thrashed, and found eighteen bushels where thirty was expected. Barley generally pretty good. Oats good, especially the black Tartarian sorts. Beans, with a few exceptions, a failure.

Leominster, Herefordshire, September 20.—Wheat is blighted very much round this neighbourhood, but cuts up better than expected; the yield will be very deficient. Barley and oats vary. Beans are partial. Peas a bad crop. Potatoes are very much affected with disease.

Bewdley, September 22.—The greater part of the wheat and a considerable portion of the oats and barley are still in the fields. That which has been thrashed does not prove half a crop and is very inferior in quality. Barley on good land is a heavy crop, elsewhere very deficient. Oats are an average. Beans quite as good as for some years past. Peas short. Potatoes have suffered much from the disease; some kinds are nearly destroyed.

Evesham, Worcestershire, September 20.—Wheat very variable; here and there a good piece is to be seen, but as a rule this crop is very bad and must be far below the average, with an unusual quantity of tail corn. Barley decidedly below an average, very little harvested in good order, and bright samples fit for malting will be the exception. Winter beans all killed by the prolonged frost; spring beans promise a fair yield where they are not blighted. Peas a very poor crop, and much damaged in harvesting. Potatoes almost a total failure. Hay crops bulky, but quality very inferior.

Stratford-on-Avon, September 20.—The wheat crop is, I think, the worst grown within the last fifty years, though there was one crop something like it about twenty years since. Barley, oats, and peas very little, if any, better. The bean crop is the best of the season, being fairly well corned, but many fields of winter beans were greatly injured by the long winter frosts, and the spring-planted crops in the wettest parts of the fields are much the worse for the excessive rains.

Tewkesbury, Gloucestershire, September 23.—When we made our annual inspection of crops some five weeks since, we were then of opinion that the wheat crops were only two-thirds of an average, and the result of the bad weather since that time must be a further diminution of the quantity; quality is exceedingly poor, good samples will be very scarce. Barley very useful where early harvested; we have seen some good berried, but slightly stained. Bean straw of great length, but not a heavy crop of corn, in fact it would be remarkable if good crops of any description are to be gathered in such a season.

Newbury, Berkshire, September 21.—A great deal of the wheat about here is badly blighted, and the yield must be very deficient, even from the best pieces. I should not put the average of our locality at more than from twenty-two to twenty-four bushels an acre all round, and of very inferior quality; some few pieces won't pay for cutting and thrashing. Barley is a fair crop; some good malting samples have been secured, not a little knocked down by the rough storms; the clover and rubbish growing up through this will make it difficult to harvest, and of but a middling quality. Oats are about an average on all our dry hilly land. Peas are certainly not more than two-thirds of a crop and very shrivelled in consequence of the straw rotting. Two neighbours of mine, with an experience of more than forty years each, say that the present harvest will be the most disappointing in its results of any they have helped to gather.

Saddlescombe, Sussex, September 20.—On the South Downs, and on the southern slopes to the sea, straw crops are an average in bulk, but in yield and quality we fear they will prove woefully deficient. Harvest is fully three weeks later than usual, and there is still a considerable area to cut and a large proportion to gather. On the clays of the Wealden, particularly where not efficiently drained, farmers' prospects are still worse. Peas are generally a failure, and beans not much better.

Barnstable, September 23.—Throughout North Devon a very ungenial season has been experienced, consequently all cereal crops are defective, particularly wheat and barley. Oats may prove about an average, but the two former much below, and with the past and present unfavourable weather, very little has been secured in first rate condition. Potatoes are really a very rotten crop.

Plymouth, September 19.—We hear wheat is very deficient in quality and quantity, how much will be found on thrashing. So far very little thrashed. Barley a light yield, and little very good. Oats a good crop. Potatoes very bad and very few eatable.

Londonderry, September 20.—Our oat crop this year will be fully equal to former years, and if the present weather lasts for fourteen days the condition will be very good. Farmers state the yield per acre is better than last year on lands of good quality.

Dublin, September 20.—With a continuance of present favourable weather, we expect wheat will yield a light crop. Grain thin, but, considering the wetness of the season, condition fair. Barley and oats generally fair on light soil, but irregular in condition and quality on heavy land. All early kinds of potatoes suffered seriously from disease, but late qualities are so far only slightly attacked.

Cork, September 20.—Potatoes appear to be a large crop, but the disease has attacked them extensively, except where newly imported seed was used, and those sorts we hear have grown very healthily. Oats are considered to be very good, and the quality much superior to last year; if the present fine weather continues a little longer to save them in good condition, they ought to give a satisfactory return.

Waterford, September 22.—The weather, during the past week, has been very fine until yesterday, enabling the farmers to secure their crops in very fair condition. Wheat is a poor crop, plenty of straw, but a light head. There is, however, but little grown in this neighbourhood. Oats are an excellent crop and largely grown; samples which have already appeared at market show a fine quality and good weight. Potatoes variously reported of: in some parts they are good, and free from disease, in other places small and much damaged. Turnips and mangolds will prove light crops, owing to want of heat to swell the bulbs.

HARVEST OF 1879.

The annual harvest inquiry of the *Agricultural Gazette* was three weeks later than usual, and it was still a fortnight too early, for the harvest was at least a month behind. Its correspondents were, however, able, with few exceptions, to speak with confidence; and their reports may be taken as a true account of what was a very dismal outlook. At least three-ourths of the wheat reports were below an average, nd only 1 per cent. was over average; and barley, beans, and peas were almost as bad. The general esults of the correspondence are given arithmetically in the following tables, of the numbers of the re-orts received over average, and under average, espectively:—

HARVEST RETURNS, 1879.

1879.	Wheat.	Barley.	Oats.	Beans.	Peas.
ver average	3	9	58	10	7
verage	69	103	169	66	61
nder average	220	180	68	145	130
Total............	292	262	295	221	198

Reducing these to percentage numbers, for their mparison with those of previous years, we have the llowing table:—

1879.	Wheat.	Barley.	Oats.	Beans.	Peas.
er average	1	4	20	4½	4
erage	24	35	57	29½	37
der average......	75	61	23	65	66
Total	100	100	100	100	100

Compare, now, these percentages with those of the urns received in 1878, 1877, and 1876 respectively, d it will be seen that even with the worst of them re was a doleful contrast.

1878.	Wheat.	Barley.	Oats.	Beans.	Peas.
er average	24	14	22	7	6
erage	58	43	50	63	55
der average......	18	43	28	30	39
Total	100	100	100	100	100

1877.	Wheat.	Barley.	Oats.	Beans.	Peas.
Over average	3½	10	23	12	8
Average	24⅝	50	49	69	61
Under average......	71⅞	40	28	19	31
Total	100	100	100	100	100

1876.	Wheat.	Barley.	Oats.	Beans.	Peas.
Over average	12	12	15	12	22
Average	48	54	20	44	67
Under average......	40	34	65	44	11
Total	100	100	100	100	100

Of these three previous years, 1877 was the worst; but, even with the bad account of that year's produce, this of the wheat and barley, beans and peas of 1879, at the date of the corn harvest, compares unfavourably. Oats alone were a fair and average crop. The harvest-work was extremely tedious and difficult, most of the corn, even in the midland counties, being carried in October—and the produce on the whole, inferior to any harvest within recollection.

To this account of the cereals it must be added that potatoes were everywhere either a failure or rapidly on the road to destruction; that the hay crop, most of it badly made, was not completely harvested before autumn; and that the mangel, swede, and turnip crops were late and generally foul, and less area than usual.

HARVEST OF 1879.

The agricultural returns recently published show that this decrease amounted to 326,000 acres, or one tenth of the wheat acreage of the previous year. The total extent under wheat was therefore reduced to 3,056,000 acres, and the yield of this, at 2½ qrs. to the acre, will be only 7,640,000 qrs. The population of the United Kingdom being now slightly over 34,000,000, the requirements of wheat will be not less than 23,800,000 qrs., of which only 7,640,000 qrs. will be supplied by the home producers, and the unprecedented quantity of 16,160,000 qrs. must be imported. This is 3,000,000 qrs. in excess of the average imports of the last five years, which comprised three very deficient harvests, and 6,500,000 qrs. in excess of the five years 1867-72, when the 3,500,000 acres under wheat produced average harvests. The following table will show the rapid change in the proportion of home produce and imports and their values:—

	Average home produce.	Average price.	Average value of home produce.	Average imports.	Average value of imports.
	Qrs.	s. d.	£	Qrs.	£
1867-72 (5 years) ..	12,343,000	55 0	33,943,000	9,667,000	26,584,000
1873-78 (5 years) ..	10,089,000	47 6	23,961,000	13,050,000	30,660,000
1879......	*7,645,000	*58 0	*22,156,000	*16,160,000	*46,870,000

* Estimated.

For our importations of wheat, rendered necessary by the deficient harvests of 1879, we shall have to pay £16,000,000 more than for the average imports of the last five years, and £20,000,000 more than on the average of 1867-72. This is on the assumption that the price of wheat will not rise any higher. Every additional rise of 5s. per qr. will cost the consumer £6,000,000, of which the table shows £2,000,000 will go into the pockets of the home producer and £4,000,000 will go abroad for payment of foreign supplies.—*Statist.*

THE WHEAT CROP OF 1879.

By J. B. Lawes.

OF the numerous bad wheat crops which it has been my misfortune to report upon in recent years, that of 1879 is pre-eminently the worst. It is certain that no crop so bad has been harvested since 1816. A comparison of the amounts of rainfall, and of the number of days on which rain fell during the months when dry weather is of the greatest importance for the production and ripening of the grain, is much in favour of the season of 1816. But in 1879 the weather has been much less unfavourable for securing the late crop. The farmer of the present day has, moreover, many advantages over his predecessors in 1816, in the way of appliances for the harvesting of his crops.

In the field at Rothamsted in which wheat is grown every year the plant did not appear to have suffered much from the severity of the past winter, and on all the plots to which I shall refer it was fairly full, and even in the early spring. In an adjoining field where twenty-three different varieties of wheat were grown after clover in 1878, which gave two crops of hay, and was afterwards fed, very considerable injury was done by wireworm. The injury was, too, very unequal, some varieties suffering very much more than others. The results obtained cannot, therefore, be relied upon as showing with any accuracy the comparative yield of the different varieties.

In the following table is given the produce of wheat in 1879, on the same differently-manured plots in the field which has now grown the crop for thirty-six years in succession, as have been selected for the purpose of forming an estimate of the average yield of the wheat crop from 1852 inclusive, up to the present time. There is also given, for comparison, the average produce on the same plots over the last ten years, 1869–78; over the preceding seventeen years, 1852–68; and over the total period of twenty-seven years, 1852–78, during which the same manures have been annually applied to the respective plots.

It will be seen that the continuously unmanured plot has given this year only 4¾ bushels of dressed corn per acre; 11 bushels being the average of the last ten years, 14⅞ bushels the average of the seventeen years previous to the last ten, and 13⅜ bushels the average of the twenty-seven years. Even the wretched yield of 4¾ bushels must be reduced to bring it fairly into comparison with the average yield of the previous seasons, as the weight per bushel was this year only 52½ lbs., or nearly 5⅜ lbs. less than the average of the preceding twenty-seven years, nearly 57·9 lbs., at which weight the 4¾ bushels per acre would be reduced to little more than 4¼ bushels.

Harvests.	Unmanured Plot 3.	Farmyard manures Plot 2.	Artificial Manures. Plot 7.	Artificial Manures. Plot 8.	Artificial Manures. Plot 9.	Means of Plots 7, 8, 9.	Means of Plots 3, 2, and 7, 8, 9.
Bushels of Dressed Corn per Acre.							
1879	4¾	16	16¼	20½	22	19½	13½*
Average 10 years, 1869–78	11	31¾	28¼	33⅜	37⅛	33	25¼†
Average 17 years, 1852–68	14⅞	35½	36⅛	38¾	36⅝	37	29⅛‡
Average 27 years, 1852–78	13⅜	34⅛	33¼	36¾	36⅞	35⅝	27¾§
Weight per Bushel of Dressed Corn, Lbs.							
1879	52.5	56.8	56.7	56.5	56.5	56.6	55.3
Average 10 years, 1869–78	58.4	60.2	59.7	59.6	59.4	59.5	59.4
Average 17 years, 1852–68	58.1	60.0	59.3	58.9	58.2	58.8	59.0
Average 27 years, 1852–78	57.9	60.1	59.4	59.2	58.6	59.1	59.0
Total Straw, Chaff, &c., per Acre, Cwts.							
1879	6⅞	20	26⅞	37¼	38⅞	34⅜	20⅜
Average 10 years, 1869–78	9	30⅝	28½	36⅝	42	35¾	25
Average 17 years, 1852–68	13⅜	34	36⅝	42⅝	41⅝	40⅜	29¼
Average 27 years, 1852–78	11¾	32⅝	33⅝	40⅜	41¼	38⅜	27⅝

* Equal to 12¼ bushels at 61 lbs. per bushel.
† Equal to 24⅝ bushels at 61 lbs. per bushel.
‡ Equal to 28⅛ bushels at 61 lbs. per bushel.
§ Equal to 26⅞ bushels at 61 lbs. per bushel.

The plot receiving 14 tons of farmyard manure per acre annually gives this year only 16 bushels of dressed corn, against over 34, the average of the preceding twenty-seven years. And, if brought to the same weight per bushel as the average of that period the 16 bushels would be reduced to little over 15, and the produce of 1879 is thus shown to be nearly 56 per cent. below the average for that plot.

Of the three artificially manured plots, plot 7 gives almost exactly the same as the dunged plot, namely, 16¼ bushels, which, making allowance for deficient weight, is considerably less than half its average. Plot 8, which is more heavily manured, gives 20⅛ bushels; which, reduced for deficient weight per bushel, is very little more than half the average. Lastly, plot 9 gives 22 bushels; which again, reckoned in the same way, is not much more than half its average. The mean of the three artificially manured plots is 19½ bushels, at 56¼ lbs. per bushel; equal, at the average weight per bushel over the twenty-seven years, to little more than 18½ bushels, against an average of 35⅝ bushels over the twenty-seven years. This year, therefore, the average produce of the three artificially manured plots is less than 1 bushel above half the average.

Taking, as in previous years, the mean produce of the unmanured plot, of the dunged plot, and of the three artificially manured plots reckoned as one, we have for the so calculated average produce of 1879 only 13½ bushels of dressed corn at the low weight of 55⅓ lbs. per bushel. This is equal to only 12⅝ bushels, at 59 lbs. per bushel, the average weight over the preceding twenty-seven years, and to only 12¼ bushels at the standard weight of 61 lbs. per bushel. Reckoned at the same weight of 61 lbs. per bushel, the average of the same plots was 24⅝ bushels over the last ten years, 28⅛ bushels over the preceding seventeen years, and 26⅞ bushels over the twenty-seven years. Thus, brought to a uniform weight of 61 lbs. per bushel; the average produce of 1879 is 54½ per cent. below the average of the previous twenty-seven years; or, excluding the last ten years, 56½ per cent. below the average of the first seventeen of the twenty-seven years. In other words, taking the average produce of the twenty-seven years as 100, that of 1879 is only 45½, or taking the average produce of the seventeen years as 100, that of 1879 is only 43½.

Looking to the quantity of straw grown, it is seen that in 1879 there is a great deficiency compared with the average on both the unmanured and the dunged plots, but comparatively little deficiency on the artificially manured plots. Plots 8 and 9, indeed, each give not far from 2 tons of straw per acre. Even in the bad season of 1877, with less straw than this year, plot 9 gave 40 bushels of dressed corn, whereas this year it only gives 22 bushels of a lower weight per bushel.

Of the twenty-three varieties of wheat grown in the adjoining field, Rivetts, which last year gave 66¼ bushels, this year gives only 16 bushels, or more than 50 bushels per acre less, or, if reckoned at the same weight per bushel as last year, only 13⅜ bushels, or 52⅞ bushels deficiency compared with last year. In fact this year the crop of this variety seemed quite unable to ripen its seed under the conditions of excess of moisture and low temperature which prevailed. The highest produce yielded by any variety this year was 32⅛ bushels, at 56¼ lbs. per bushel, which was also nearly the highest weight among the series, but 5½ lbs. less than the weight of the same variety (Main's standing white) last year. The average produce of all the varieties is this year 21¼ bushels, at 53⅜ lbs. per bushel; the average over the eight preceding years being 43½ bushels, at 61¼ lbs. per bushel. There is thus a deficiency in 1879 compared with the average of 51 per cent. in actual bushels measured, and of more than 57 per cent. in actual quantity of corn, making allowance for the deficient weight per bushel. As, however, as already said, great injury was done by wireworm with most of the varieties, and much more with some than with others, it is unsafe to place much reliance on the actual and comparative quantities yielded.

Reference to note ‡ at the foot of the foregoing table will show that, over the seventeen years 1852–1868, the average produce of the selected and very differently manured plots in my permanent experimental wheat field was between 28 and 28½ bushels, reckoned at 61 lbs. per bushel. There is no doubt, too, that this amount, indicated by the selected experimental plots, also very closely represented the average produce per acre of the United Kingdom over that period.

If we were to take the figures as they stand, and assume that the yield of the United Kingdom is this year equal to only 12¼ bushels per acre at 61 lbs. per bushel, this would give on the 3,047,752 acres under the crop, after deducting 2¼ bushels per acre for seed, less than 4 million qrs. available for consumption. Considering, however, that it is the more southern districts of England which have suffered the most from the weather, and that the light lands have suffered less than the heavy ones, I am disposed to estimate the amount of home-produced wheat available for consumption, after deduction of seed, to be equal to 5 million qrs. at the standard weight of 61 lbs. per bushel. This is equivalent to an average produce per acre of about 15½ bushels at 61 lbs. per bushel. Deducting 5 million qrs. from the 23⅜ millions required to feed the population, there remain 18⅜ million qrs. to be supplied from stocks and foreign sources.

If the results obtained at Rothamsted, both in the permanent wheat field and with the numerous varieties of wheat, be accepted as indicating the quality as well as the quantity per acre over the country at large, the farmer will benefit but little by the rise of price hitherto reached. Thus the average weight per bushel of the twenty-three varieties of wheat is this year only 53⅜ lbs.; whereas the average weight over the preceding eight years has been 61¼ lbs. It is, therefore, this year 12½ per cent. less than the average. It is obvious that the farmer would have to deliver more than 9 bushels of the produce of this season to supply the same weight as in 8 bushels of the previous seasons. Nor would this be all. For, with the lower weight per bushel, much of the grain is so thin, and contains so much husk and so little flour, that it will be only fit for the mill at all when used with a large admixture of foreign grain, and will, consequently, command comparatively low prices. In 1863, which is the year in which I commenced to give an annual report and estimate of the wheat crop, the mean produce of the three artificially manured plots was 55 bushels per acre, with an average weight per bushel of 62⅜ lbs. In 1879 the very same manures have given an average of only 19½ bushels, at 53⅜ lbs. per bushel; equal to only 16⅞ bushels at the same weight per bushel as in 1863. We have here a striking illustration of how great is the influence on the results of the farmer's efforts of circumstances entirely beyond his control, after he has employed all the resources at his command to obtain a good crop.

THE HARVEST, 1879.

[TIMES, Nov. 3.]

Farmers have harvested in the South and are still cutting and carrying in the later districts, including large portions of the Northern counties and Scotland, probably the worst wheat crop on record since the year 1816. The inference drawn two months ago from a consideration of the backward and sodden condition of the plant in spring, the exceptionally low mean temperature of the summer, the absence of sunshine even on otherwise mild days, the undue prevalence of excessive moisture in the air, the extraordinary series of deluging downfalls of rain, the incessant repetition of storms throughout the summer, and the late cold and wet period for ripening, has been strictly verified in a most deficient yield of wheat. The favourable harvest-time then hoped for as the remaining chance for mitigating by good, dry condition the inevitable shortness in yield came not; but, in place of the hot, bright season of ingathering so earnestly desired, a late, wet, winterly time has further damaged the crops, almost to the point of destruction in many cases; and farmers in all parts of the Kingdom have had to struggle against the delays and disappointments of a most difficult time for reaping and carting. Early estimates of the probable total production of grain were published by various authorities, all announcing a very great deficiency in wheat and barley. But now the reports from all parts of the country, confirmed by personal observation in many corn-growing centres, intensify the darkness of the picture which those early estimates drew; and the public do not yet seem awake to the full magnitude of the calamity which has fallen upon agriculturists, and, through them, upon the whole community.

The general estimate of the outturn of the crop for 1879 may be stated at only 18 bushels per acre, after making allowances for the several considerations above named. The foregoing table gives the figures for fourteen years.

ESTIMATED WHEAT PRODUCTION OF THE UNITED KINGDOM.

Year.	Acres.	Assumed Yield per Acre.	Available for Consumption after deducting Seed, in Quarters.
		Bush.	
1866	3,661,000	Under average 27	11,440,000
1867	3,640,000	Much under average ..25	10,390,000
1868	3,951,000	Much over average....34	15,790,000
1869	3,982,000	Under average 27	12,490,000
1870	3,773,000	Over average..........32	14,100,000
1871	3,831,000	Under average 27	11,970,000
1872	3,840,000	Much under average . 23	10,110,000
1873	3,670,000	Much under average ..25	10,550,000
1874	3,833,000	Over average..........31	13,700,000
1875	3,514,000	Much under average ..23	9,124,000
1876	3,124,000	Under average 27	9,665,000
1877	3,321,000	Much under average ..22	9,432,000
1878	3,382,000	Over average..........30	11,825,000
1879	3,056,000	Much under average ..18	5,990,000
Average of 14 years ..	3,612,000	Mean of 14 years 26½	11,184,000
Standard produce	3,612,000	29½ bushels per acre	12,053,000

It appears that while the first five years averaged 29 bushels per acre, which is taken as about the standard or normal yield, the last five years averaged only 24 bushels; the mean yield for the fourteen years being thus lowered to 26½ instead of 29½ bushels. The over-average yields were 34 bushels in 1868, 32 bushels in 1870, 31 bushels in 1874, and 30 bushels (barely exceeding an average) in 1878. The lightest yield in the series until the present year was 22 bushels in 1877, while 1875 gave only a bushel more. For 1879 our inquiries lead us to the unprecedented and pitiful yield of 18 bushels net, which may be looked upon as two-thirds of an average in quantity, reduced by corrections for inferior quality, &c., to little over three-fifths of a normal or standard yield.

In the following table the counties are arranged in the order of greatest acreage sown with wheat, and the fourth column gives the estimated amount of produce in imperial quarters which the present harvest would have realized had it been a normal or standard average crop:—

County.	Standard average yield of wheat in bushels, per acre.		Acres of wheat grown in 1879.		Produce of 1879 had the crop been an average, in imperial qrs.
Lincolnshire............	32¾	..	247,100	..	1,011,600
Yorkshire	30	..	217,100	..	814,100
Norfolk................	31	..	178,700	..	692,500
Essex..................	33	..	162,100	..	663,700
Suffolk	28¾	..	134,600	..	483,700
Cambridgeshire	33	..	117,500	..	484,700
Devonshire	21½	..	107,400	..	288,600
Hampshire	29½	..	100,100	..	363,100
Sussex	30	..	89,100	..	334,100
Kent	33¾	..	89,000	..	363,700
Wiltshire	29	..	87,000	..	315,400
Gloucestershire	28	..	80,800	..	282,800
Shropshire	26	..	87,100	..	218,000
Northamptonshire	32½	..	68,200	..	274,900
Somersetshire	29	..	61,400	..	222,600
Warwickshire	30	..	60,300	..	226,100
Nottinghamshire	30	..	60,000	..	225,000
Hertfordshire	28½	..	58,400	..	201,600
Worcestershire	33	..	55,100	..	179,100
Berkshire	31½	..	55,000	..	216,600
Oxfordshire	31	..	54,400	..	210,800
Buckinghamshire	29	..	51,100	..	187,200
Herefordshire	29½	..	49,300	..	185,800
Bedfordshire............	30	..	47,400	..	177,800
Staffordshire............	29½	..	43,800	..	161,500
Cornwall	25	..	43,200	..	135,000
Huntingdonshire........	32½	..	43,100	..	175,100
Dorsetshire	29	..	39,400	..	142,800
Surrey	28	..	38,300	..	134,000
Leicestershire	31	..	34,100	..	132,100
Durham	26	..	30,500	..	99,100
Lancashire	32	..	27,600	..	110,400
Cheshire	30	..	25,300	..	94,900
Derbyshire	29	..	23,000	..	83,400
Northumberland	27	..	22,800	..	76,900
Monmouthshire	29	..	16,400	..	59,200
Cumberland	29	..	16,300	..	59,100
Rutland	31½	..	8,500	..	33,200
Middlesex	31	..	6,800	..	26,300
Westmoreland	28	..	1,200	..	4,200
Total for England	29$\frac{9}{10}$	..	2,719,500	..	10,161,700
Wales	27	..	94,600	..	316,700
Scotland	29	..	76,600	..	277,700
Total for Great Britain	29$\frac{7}{10}$	..	2,890,700	..	10,756,100
Ireland	25	..	157,500	..	492,200
Islands	28	..	8,600	..	30,100
Total for the United Kingdom	29½	..	3,056,800	..	11,278,400

THE FOREIGN HARVEST.

In pursuance of a resolution passed by the International Congress of the Hague in 1869, and confirmed, in 1872, at the St. Petersburg Congress, **France** was charged with the task of drawing up a **return** of the total production of cereals in Europe. **The** work was confided to the statistical department **of the** Ministry of Agriculture and Commerce, and **the** results of its long and arduous labours are now **made** public. It appears that the total cereal production of Europe amounts at present to an average of 1 milliards 816 millions of hectolitres per annum. **Of** this Russia alone furnishes 584 millions, or about one-third of the whole; Germany 270 millions, France 250, and Austria 200. The cereal produce of America is put down at 559 millions of hectolitres. **To** understand the full importance of these figures it is necessary to make a few comparisons Thus, while America, with a population of 40 millions, produces 559 millions of hectolitres of cereals, or about 14 hectolitres per head, Europe, with a population of 297 millions, produces only 1,816 millions of hectolitres, or about six hectolitres per head. The following table gives the amount of cereals per inhabitant produced by the various States of Europe :—

	Hectolitres.		Hectolitres.
Roumania	14.4	Ireland	4.6
Denmark	11.8	Turkey	4.6
Russia	8.1	Finland	4.4
Prussia	8.0	Great Britain	4.2
France	6.9	Saxony	3.8
Bavaria	6.5	Servia	3.8
Austria-Hungary	5.8	Holland	3.2
Sweden	5.5	Norway	3.1
German Duchies	5.1	Greece	3.1
Belgium	4.9	Italy	2.8
Spain	4.9	Portugal	2.8
Wurtemberg	4.7	Switzerland	2.1

Now, as according to the most moderate estimates, the average quantity of cereals necessary for the consumption of every inhabitant is 5½ hectolitres per annum, it results from the above returns that all those States which come after the German Duchies are obliged to have recourse to foreign importation. In America three-fifths of the cereals consist of maize. In Europe, oats predominate; then come wheat and rye, and finally barley, maize, and saracen, in the order given. The nations of Europe which produce, relatively speaking, the most wheat, are Spain, Italy, and France; those which furnish the most rye are Finland, Switzerland, and Germany; and those which produce the most barley the Scandinavian States and Germany. Oats predominate in Ireland, the Scandinavian countries, Hungary, and North Germany.

THE GENERAL HARVEST.

Below is an estimate of the proportionate yield of the present season. The figures are suggestive, but can scarcely be adopted for statistics. In the following table, which shows the result of the wheat crop, 100 is taken to represent an average :—

Country.	Wheat.	Maize.	Rye.	Barley.	Oats.
United States	117½	105	—	—	—
Russia. Central	60	—	60	70	95
,, North	90	—	75	100	100
,, South	60	—	65	70	100
,, Poland	80	—	45	50	—
,, Podolia	60	—	50	55	100
,, Bessarabia	85	140	80	90	100
France	78	—	75	95	105
Germany	90	—	95	103	102
United Kingdom	70	—	—	90	95
Austro-Hungary	72	—	80	80	105
Wallachia	70	60	—	75	—
Moldavia	80	60	—	75	—
Switzerland	85	—	65	100	120
Sweden and Norway	95	—	95	105	95
Denmark	100	—	85	95	100
Italy	65	65	—	—	95
Egypt	105	—	—	—	—
Spain and Portugal	80	—	—	—	—
Algeria	100	—	—	—	—
Greece	100	—	—	—	—
Belgium	85	—	85	95	100
Holland	85	—	90	95	100
Canada	100	—	—	—	—

THE FRENCH HARVEST

is officially estimated as below :—

Region.	November 16.	Hectolitres.
1	North-west	8,821,023
2	North	19,903,960
3	North-east	7,350,570
4	West	11,550,917
5	Centre	8,333,929
6	East	9,215,487
7	South-west	6,505,365
8	South	4,166,351
9	South-east	5,899,180
10	Corsica	405,500
		82,152,282

And being only about 27½ million of qrs., an import of some 7 million qrs. should be required. Compared with the yield of 1878, that of the season is considered slightly superior in quantity and in quality. A very deficient vintage is also announced, the result of the bad meteorological season throughout the year.

PRUSSIA.

The result of last year's harvest being taken at 100 kilogrammes per hectare, this year's yield in the various provinces of Prussia will, as near as possible, be as follows for the five most important products—namely, wheat, rye, barley, oats, and potatoes :—

	Wheat.	Rye.	Barley.	Oats.	Potatoes.
East Prussia	108	114	97	93	116
West Prussia	103	118	98	96	136
Brandenburg	104	84	85	96	99
Pomerania	98	104	103	102	109
Posen	101	92	81	87	112
Silesia	102	104	90	109	95
Saxony	96	95	89	108	110
Schleswig-Holstein	99	97	114	108	75
Hanover	101	100	106	109	93
Westphalia	101	92	101	103	89
Hesse-Nassau	100	87	104	97	107
Rhineland	104	102	106	108	95
Hohenzollern	94	81	82	97	118
Prussia (State of)	100	103	94	102	95

This year's wheat crop, therefore, in the Prussian State is estimated as equal to that of last year, a larger return being expected from rye and oats, and a lesser from barley and potatoes as compared with 1878.

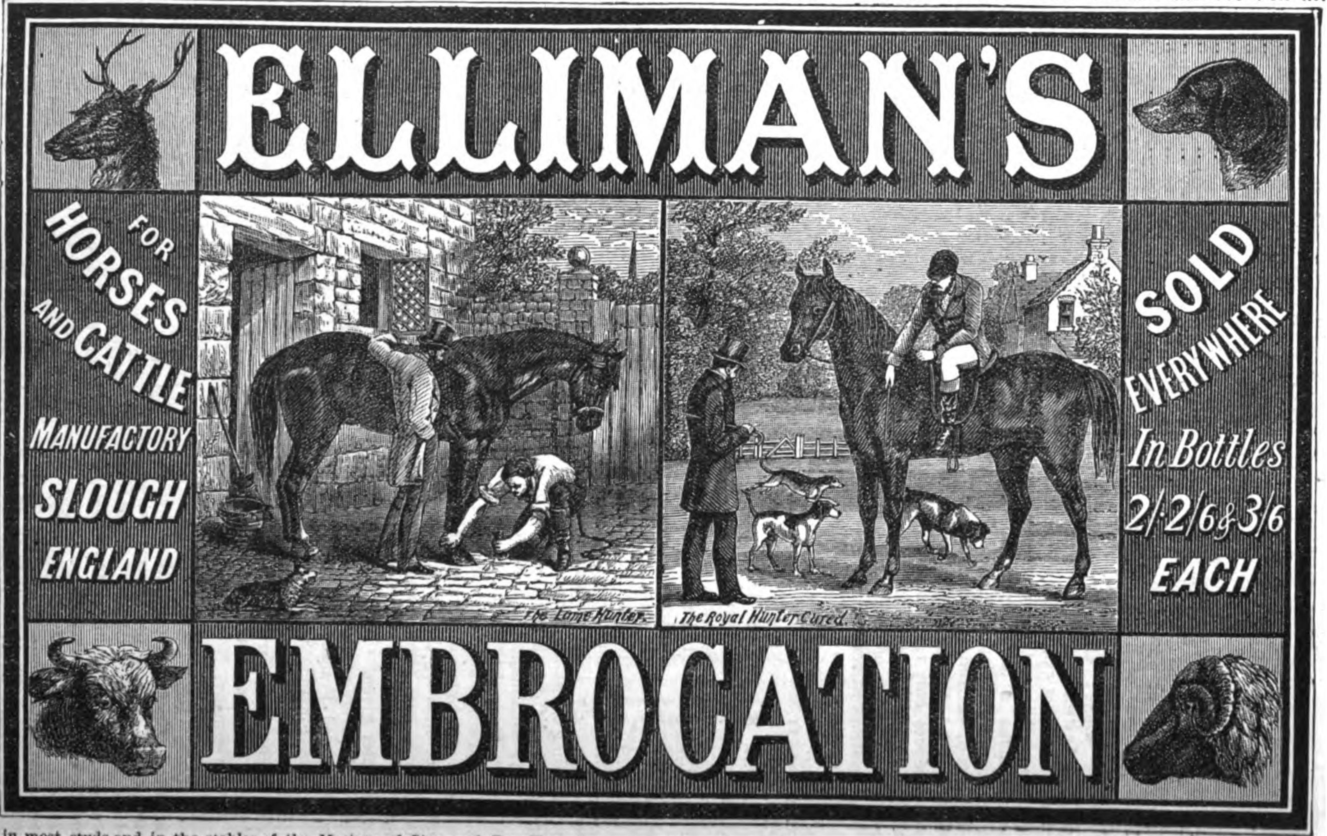
THE RUSSIAN HARVEST.

The annual official circular on the crops of Russia state that the harvest of the present year will be, on the whole, fairly good. In the Government of Koursk the cereal crops are generally very satisfactory, the exception being oats, which are only middling. In the Government of Voronej the high range of temperature had had a pernicious effect on the condition of the winter-sown wheats and still more on the spring grain, and the harvest is below the average. In the Government of Tula, on the other hand, a fairly good yield of winter and spring wheat is reported. From the Governments of Penza, Kazan, and Vladimir the reports are various, the ultimate estimate being that the crops are moderate.

OWNERS OF DRAUGHT HORSES

WILL FIND ELLIMAN'S ROYAL EMBROCATION BOTH EFFICACIOUS AND ECONOMICAL IN KEEPING THEIR HORSES' LEGS SOUND AND FIT FOR HARD WORK.

FOR SPRAINS OF ALL KINDS, CURBS, AND SPLINTS.
FOR OVERREACHES, CHAPPED HEELS, WIND GALLS.
FOR RHEUMATISM IN HORSES.
FOR SORE THROATS AND INFLUENZA.
FOR BROKEN KNEES, BRUISES, WOUNDS, CAPPED HOCKS.



FOR SORE SHOULDERS, SORE BACKS.
FOR SORE MOUTHS IN SHEEP AND LAMBS.
FOR FOOT ROT IN SHEEP.
FOR SPRAINS, CUTS, AND BRUISES IN DOGS.

Is used in most studs and in the stables of the Masters of Stag and Fox Hounds; among others in the stables of the EARL OF MACCLESFIELD, the MARQUIS OF HUNTLY, HON. R. BAILLIE HAMILTON, M.P., LORD MIDDLETON, DUKE OF BUCCLEUCH, EARL OF YARBOROUGH, EARL OF SHANNON, EARL OF EGLINTON AND WINTON, EARL OF ZETLAND, J. T. D. LLEWELLYN, Esq., ALBERT BRASSEY, Esq., JOHN B. BOOTH, Esq., CHARLES MORRELL, Esq., Capt. R. TONSON RYE, Lieut.-Col. EVERETT, J. B. HANKEY, Esq., ANTHONY L. MAYNARD, Esq., Lieut.-Col. R. H. PRICE, ALGERNON RUSHOUT, Esq., R. LANT, Esq., J. BELLAMY, Esq., G. F. LUTTRELL, Esq., O. W. WICKSTED, Esq., VISCOUNT VALENTIA, W. DE SALIS FILGATE, Esq., B. C. CHAMPION, Esq., J. S. GIBBON, Esq.,

Agricultural Shows.

CATTLE.

SHORTHORNS.

BULLS.

ANCHOR (32,947), roan, calved February 19, 1874, bred by Mr Richard Chaloner, King's Fort, Moynalty, county Meath, Ireland, and now in the possession of Lord Rathdonnell, Lisnavagh, Tullow, county Carlow. This bull has taken the first prize in the old bulls' class at the Kilburn Royal, at the meeting of the Royal Dublin Society, at the Newry meeting of the Royal Agricultural Society of Ireland, and at the Perth meeting of the Highland and Agricultural Society of Scotland, during the year 1879. He was also a prize-winner in Ireland in1878, and obtained a commendation at the Bristol Royal in 1878. At Kilburn he appeared in plain working order, with no superfluous fat upon him, and indeed rather bare of flesh. His colour is not taking, being a roan made up of a yellowish red and white, and his coat —which is short and thin—was then rather staring. His head is not of the best character, and he has a thin and somewhat papery hide. But after every possible fault has been found with him he is an undeniably good shorthorn, and apparently one of the most useful animals which stood in the shorthorn ranks at Kilburn. Being so bare of padding he looked narrow in comparison with the over-fed animals with which he had to contend, but his framework admits of very little adverse criticism. He is built on a large scale, and is long, level, and symmetrical. He is rather flat along his fore ribs, and small in his thighs and twist, and a little too bare in front of his shoulder. But the depth of his forehand, the great width and depth of his quarters, a well set-on tail, his great length, together with his bold, free, and active gait, cannot fail to impress the on-looker with his merits as a shorthorn bull of the first water. He is quite outside the ring of "fashion," which may, perhaps, account for his real worth.

ATTRACTIVE LORD (32,968), red and white, calved May 30, 1874, bred by Mr T. Pears, Hackthorne, and now in the possession of the Earl of Ellesmere, Worseley Hall, Manchester. The first prizes taken by this bull at the more important agricultural shows have been at the Bristol Royal, the Royal Manchester and Liverpool Agricultural Society's meeting at Lancaster, and at the Louth meeting of the Lincolnshire Agricultural Society in 1878; also at the Stamford meeting of the Lincolnshire Society, the Leeds meeting of the Yorkshire Society, and the Manchester meeting of the Royal Manchester and Liverpool Society in 1879. He was placed second in his class at the Oxford Bath and West, and the Northallerton meeting of the Yorkshire Society in 1878; and third in the old bulls' class at the Kilburn Royal in 1879. He was also the winner of the Marquis of Ripon's Challenge Cup at Louth in 1878, and of the Champion prize as the best bull in the yard at Manchester in 1879. His position at Kilburn was the result of a decision which has not been confirmed at any subsequent show, and which was, at the time, strongly censured. Whatever might be said as to the claims of the bull Anchor to be placed before him—as an excellent animal of altogether different type—it is difficult to see by what line of judgment he could have been considered inferior to Rear-Admiral. Attractive Lord is a massive animal, of great depth and thickness, of excellent quality, good style and character, bold carriage, and a very taking colour. He is described as a red and white, but he is nearly all red. He is fine in the bone, and has a mellow hide. Altogether he is a first-rate and very handsome shorthorn, and probably about the best show bull of the day. He is now getting a little plain in his rump, but for beef points, all round, he is hard to beat.

TELEMACHUS 6TH (35,725), roan, about seven years old, bred by the Marquis of Exeter, Burghley Park, Stamford. This noted bull has taken very many first prizes during his career, the most recent being at the Dairy Show in 1879. When in his prime his great rival was Sir Arthur Ingram, whom he defeated at the Birmingham Royal in 1876, and by whom he was defeated at the Liverpool Royal in 1877. At the Kilburn Royal in 1879 he was exhibited in a family group to which a first prize was awarded, but he did not compete in the old bulls' class. He wears exceedingly well, and is shown in as good condition as ever. He is well covered with flesh, but is for all that too fat. He is of great thickness through the shoulders, and his fore legs are bowed; his ribs, crops, chine, and back are excellent, and so are his thighs and rounds. Over the hips he is not very wide. His hide is mellow, and has a good coat of light roan hair. The heads of all this family are of nice character.

TELEMACHUS 9TH, roan, calved December 4, 1873, bred by the Marquis of Exeter, Burghley Park, Stamford. This bull is by the same sire and out of the same dam as Telemachus 6th, and is very like him in colour, type, and character. But he has never been considered anything like as good. Nevertheless, the judges at the Kilburn Royal picked him out of the family group in which he was shown with Telemachus 6th, and awarded him the Champion prize of £100, as the best shorthorn bull in the yard, to the astonishment of everybody. It is true the decision was that of an umpire, but he was called upon to decide between Anchor and Telemachus 9th, and he preferred the latter. Telemachus 9th has never before been placed over the head of Telemachus 6th, and has been defeated by such animals as Royal Charmer's Duke (35,349), a plain but "fashionably" bred bull by 3rd Duke of Geneva (23,753), and others which have never been able to get into the front rank in an important showyard. By the way, it was a curious sight to see this Royal Charmer's Duke turned out of the ring amongst the first draft by the Kilburn judges, Sir Arthur Ingram highly commended (with reserve number), and Attractive Lord placed only third, in the old bulls' class, and

Telemachus 9th defeating the bull which defeated hem, and to remember that only one year ago, at the Louth meeting of the Lincolnshire Society, these four bulls were placed in the following order: Attractive Lord, first; Sir Arthur Ingram, second; Royal Charmer's Duke, third; and Telemachus 9th the reserve number! However, it must be recorded that he has got very fat over the chine, ribs, and back, and that he won the highest honour at the International meeting of the Royal Agricultural Society of England at Kilburn in 1879.

SIR ARTHUR INGRAM (32,490), roan, calved January 25, 1872, bred by Mr Wm. Linton, Sheriff Hutton, York. The showyard career of this animal has been very successful. He took first prize in his class at the Liverpool Royal in 1877, first at the Oxford Bath and West, the Dumfries meeting of the Highland Society, and the Northallerton meeting of the Yorkshire Society in 1878; second at the Birmingham Royal in 1876, and at the Bristol Royal in 1878; reserve number at the Kilburn Royal, and third at the Stamford meeting of the Lincolnshire Society in 1879. Besides these prizes he has won many others at smaller shows. He does not appear to have been able to stand the long-continued training, and at Kilburn he looked to be going to pieces fast; and he ought not to have been shown at all in 1879. Sir Arthur Ingram is a bull of excellent style, masculine character, and good carriage. He is built on a big scale, and is of great length. His forehand is deep, and his quarters broad, wide, and deep. He is thin over the crops, and hollow behind his shoulders; his hide is thin and papery, his coat thin and short, and his colour something of a brindle. With all his faults he has been, and is, a good bull, and has got good stock—the best possible criterion. At Mr Linton's recent sale he realized 72 gs.

REAR-ADMIRAL (37,310), roan, calved June 8, 1875, bred by Mr T. Willis, Caperby, Bedale, Yorkshire. This bull has had considerable success in the showyard; he took first prize in his class at the Oxford Bath and West in 1878, second as a two-year-old at the Liverpool Royal in 1877, and at the Kilburn Royal, the Stamford meeting of the Lincolnshire Society, the Perth meeting of the Highland Society of Scotland, the Leeds meeting of the Yorkshire Society, the Manchester meeting of the Royal Manchester and Liverpool Society, and the Wellingborough meeting of the Northamptonshire Society in 1879. His position at Kilburn, where he was placed before Attractive Lord, was relatively higher than at any former or subsequent show, and more recent decisions have invariably reversed the positions of the two animals. Rear-Admiral is very level, and is good over the crops and behind his shoulders, where many shorthorns are defective; but he is high on his legs, and has little masculine character; in fact, he looks like a well-fed steer. He has very little hair, and his colour is a sort of washed-out blue roan. His horns are plain, and altogether—though very neat—he is wanting in good shorthorn character.

VICE ADMIRAL (39,527), roan, calved August 19, 1876, bred by Mr T. Willis, Carperby, Bedale, Yorkshire. This animal is by the same sire and out of the same dam as Rear-Admiral, referred to above, and is very like him in style, character, and colour, but is very decidedly the better bull of the two, in spite of his still more effeminate appearance. His horns, which are short, turn downward, and this gives him a mild appearance, which has been happily compared to that of a very young man who parts his hair down the middle. He has the same lack of hair, and the same washed-out colour as Rear-Admiral. But he is very level, and has good rounds, twist, back, loin, and ribs, though not so good over the crops as Rear-Admiral. He is an undeniably "pretty" bull, and is very taking in the showyard. His successes have been of quite an exceptional nature, and from his appearance in the ring at the Liverpool Royal as a calf, where he took first prize, he has scored an uninterrupted list of firsts at all the leading shows, including the Bristol and Kilburn Royals, and all the most important county meetings each year, numbering nearly twenty. At the Stamford meeting of the Lincolnshire in 1879 he took the Marquis of Ripon's Challenge Cup from Attractive Lord, who had won it at the Louth meeting the year before.

ROYAL WINDSOR (29,890), white, calved January 6, 1869, bred by Mr T. Willis, Carperby, Bedale, Yorkshire; now, and for some years past, in the possession of Mr John Outhwaite, Bainesse, Catterick, Yorkshire. This bull is now about eleven years old, and still wears exceedingly well. He is a big animal, with more merits than faults, the latter being chiefly such as age will bring, save narrow crops. He has won many prizes, and compared very favourably with younger animals at the Kilburn Royal, where he took fourth prize over the head of Sir Arthur Ingram.

PIONEER (35,042), white, calved March 7, 1874, bred by Mr A. H. Browne, Callaly Castle, Alnwick, Northumberland. This was at one time a rather stylish animal, of nice quality, wide and deep in his quarters, but hollow behind his shoulders. His chief success in the Showyard was a first prize in his class as a two-year-old at the Birmingham Royal in 1876, since which time he has not been to the front. He was commended at the Liverpool Royal in 1877, highly commended at the Bristol Royal in 1878, and drafted out in the "first flight" at the Kilburn Royal in 1879. Since then he has taken a third prize at the Leeds meeting of the Yorkshire Society. He is now a big, plain, uneven shorthorn.

CHURCHILL (37,996), roan, calved November 16, 1876, bred by Col. R. Loyd-Lindsay. Churchill is not a shorthorn of the first water, but an exceedingly useful animal for all that. At the Oxford, Bath and West, the Bristol Royal, and the Northallerton meeting of the Yorkshire Society in 1878 he took second prizes in his class as a yearling. At the Northampton meeting of the Northamptonshire Society in 1878, the Woodstock meeting of the Oxfordshire Society, and the Exeter Bath and West in 1879 he was placed first in his class as a yearling and a two-year-old respectively, and second at the Stamford meeting of the Lincolnshire Society. In addition to this he took the champion plate as the best bull in the yard at Woodstock in 1879, and he was certainly the best shorthorn bull at the Exeter Bath and West, and probably about the best shorthorn in all the classes on that occasion, when the standard was low. He is of a good roan colour, and has a soft and mellow bull's hide of good substance, and a fairly good coat of hair. He has furnished well during the past year, and is now an animal of decent substance, good over the chine, but still rather slack behind his shoulders, which are a little plain. His quarters are not very wide nor deep, and his head—which he carries too near the ground—is rather coarse. He does not walk very well. Nevertheless he is a very useful sort of animal, and may yet improve. At Kilburn he was exhibited in a family group, to which second prize was awarded, and so did not come into competition with other bulls.

Master Harbinger (40,324), roan, calved November 18, 1877, bred by Mr W. Handley, Green Head, Milnthorpe, Westmoreland. This young bull is improving, and is furnishing himself rapidly. He is long and level, seems to be cut out for a tolerably big one, has a rather thick but soft and mellow hide, and plenty of good hair. His tail is set on very high, his legs are long, and his ribs are rather flat. He looked well at Manchester, and may improve considerably. At the Cheltenham meeting of the Gloucestershire Society this bull obtained the champion prize as the best bull in the yard, but there was nothing there of importance for him to contend with. He has, however, taken first prize in his class at the Lancaster meeting of the Royal Manchester and Liverpool Society in 1878; first at the Kilburn Royal, and the Manchester meeting of the Royal Manchester and Liverpool Society in 1879; and second at the Leeds meeting of the Yorkshire Society in 1879.

Cowslip Boy (38,051), roan, calved November 20, 1876, bred by Col. R. Nigel Kingscote, is a bull of good quality and considerable merit, and was placed second in his class as a two-year-old at the Kilburn Royal. He has good quarters, rounds, and twist, is level along the top, and has a mellow hide. But his shoulders are plain, and he is small through the heart.

Mercury, red, calved July 13, 1878, bred by Mr J. Stratton, Alton Priors, Marlborough, Wilts. This is a very promising young bull, of nice quality; he was placed first in his class at the Exeter Bath and West, and at the Kilburn Royal in 1879.

COWS.

Lady Carew 3rd, roan, calved October 5, 1876, bred by Mr B. St. John Ackers, Prinknash Park, Painswick, Gloucestershire. This is one of the most successful showyard animals of the day. Commencing at the Bath meeting of the Bath and West, she took second prize there, and third at the Liverpool Royal, both in 1877. At the Bristol Royal in 1878 she obtained a high commendation, and first prizes at the Lancaster meeting of the Royal Manchester and Liverpool Society, and the Northampton meeting of the Northamptonshire Society in the same year. In 1879 she has been placed first in her class at the Exeter Bath and West, the Leeds meeting of the Yorkshire Society, the Manchester meeting of the Royal Manchester and Liverpool Society, and the Wellingborough meeting of the Northamptonshire Society. For two years running, namely, at Northampton and at Wellingborough, this heifer has taken the Burghley Park Challenge Cup, value 100 gs., given by the Marquis of Exeter to the Northamptonshire Society, both times defeating the bull Telemachus 6th; and at Wellingborough she also defeated Vice-Admiral, who was entered specially for this competition, which is open to all England. At Manchester in 1879 she took the Champion Cup as the best shorthorn cow or heifer in the yard, defeating Mr Hutchinson's Grateful, the first prize cow at the Kilburn Royal. Besides this she has taken many prizes at shows of less note. Strange to say, this heifer was drafted to one side of the ring at Kilburn, and the judges on that occasion did not think her worth so much as a commendation ticket. Yet she has since beaten the champions of the Kilburn Royal, Telemachus 9th being in competition with her at Wellingborough, and Mr Hutchinson's Gainful being at Manchester, though not in direct competition with Lady Carew 3rd, from the fact of not being awarded a first prize in her class. This was one of the most extraordinary amongst the several extraordinary awards at Kilburn. Lady Carew 3rd is an undeniably good animal, and handles to perfection. Her quality is of the very best, and she has a fair plenty of good soft hair, not of a very taking light roan colour. Her back and ribs, and especially her quarters, are all excellent; but her rump is patchy fat, and so is her brisket. Her head is plain, her nose stained, and the tips of her horns are black. With the exception of a bareness on the loin and the items already mentioned, she is hard to find fault with; and if her rump does not get more unsightly, she must stand a good chance to win the Burghley Park Cup for the third and last time in 1880.

Lady Carew 2nd, roan, calved September 22, 1875, bred by Mr B. St. John Ackers, Prinknash Park, Painswick, Gloucestershire. This cow is by the same sire and out of the same dam as Lady Carew 3rd, and is like her in character and colour. She is more patchy on her rump, and more unsightly in her brisket, and though a good cow is not by any means as good as Lady Carew 3rd. Her most successful exhibitions have been at the Northampton meeting of the Northamptonshire Society in 1878, at the Stamford meeting of the Lincolnshire Society, and the Wellingborough meeting of the Northamptonshire Society in 1879. She was placed fourth in the cows' class at the Kilburn Royal by the same judges who overlooked an animal of similar character, but better in every respect, namely, Lady Carew 3rd. This cow is of excellent quality, and has been shown in many of the county meetings with more or less of success.

Telemacina, roan, calved November 21, 1873, bred by the Marquis of Exeter, Burghley Park, Stamford. This cow is of the same colour and character as the noted Telemachus family, to which she belongs. She has not been very often shown, and is in high condition. At the Kilburn Royal she was placed second to Mr Hutchinson's Grateful, as she was also at the Manchester meeting of the Royal Manchester and Liverpool Society; but at the Stamford meeting of the Lincolnshire Society, and the Leeds meeting of the Yorkshire Society she was placed first—each time in competition with Grateful. She has won several county show prizes in addition to those already mentioned. She is a massive animal, of excellent quality, but a great deal too fat for any useful purpose.

Sea Gull, roan, calved April 15, 1868, bred by the Marquis of Exeter. This fine old shorthorn cow was exhibited at the Kilburn Royal, with five of her offspring, including the Telemachus bulls already mentioned, and two excellent heifers; namely, Sea Bird, roan, calved May 21, 1876, and Sea Lark, roan, calved March 26, 1877. Sea Lark is a particularly good heifer, and was, in the opinion of some onlookers, more deserving the Champion prize as best shorthorn female in the yard than the one to which it was awarded. The first prize was awarded to this group in the class to which it belonged.

Grateful, roan, calved December 24, 1874, bred by Mr T. H. Hutchinson, Manor House, Catterick, Yorkshire. The record made by this cow is as follows :—At the Liverpool Royal, in 1877, she was first in her class ; at the Bristol Royal, in 1878, she was placed fourth, and first at the Northallerton meeting of the Yorkshire Society the same year. In 1879 she was first in the cows' class at the Kilburn Royal, and first at the Manchester meeting of the Royal Manchester and Liverpool Society ; second at the Stamford meeting of the Lincolnshire Society, and third at the Leeds meeting of the Yorkshire Society. She is a very thick, massive animal, exceedingly fat, but devoid of flesh as well. Her rumps are very uneven and unsightly, and although an undeniably good cow she lacks the style and character of a first-rate shorthorn. At Leeds it will be noted that she obtained only third place when in competition with Telemacina.

GAINFUL, roan, calved October 22, 1877, bred by Mr T. H. Hutchinson, Manor House, Catterick, Yorkshire. She is of similar character to her dam Grateful, and some day her rump may be as plain. Her quarters are not wide, but long and deep ; she is very thick for a heifer, and has good back and loin. Behind the shoulders she is rather slack, and a little bare and hollow over the hips, and she stands rather high on the leg. However, she obtained the first prize in her class at the Kilburn Royal, and the Champion prize of £100, as the best shorthorn female in the yard. Very few consider this honour to be deserved ; and it is worthy of note that at the Manchester meeting of the Royal Manchester and Liverpool Society, when she came again into competition with a heifer, Tulip 4th, which was only fourth in the same class at Kilburn, Gainful was defeated—as she was at Leeds by Kirklevington Empress 3rd, which was placed second to Gainful at Kilburn. She was second at the Northallerton meeting of the Yorkshire Society in 1878, and has taken other prizes. Whilst she is certainly a good heifer, and has special merits for her age, it is not very apparent that she can rightly be considered the best shorthorn female of the day.

KIRKLEVINGTON EMPRESS 3rd, roan, calved August 18, 1877, bred by Lord Fitzhardinge, Berkeley Castle, Gloucestershire. An animal of excellent quality, with a capital coat of good hair, stylish, and pleasant to the touch. This heifer has all the character of a well-bred shorthorn, but is plain on the rump. She is by the long-priced Duke of Connaught (33,604), and was by many considered to be deserving of first prize in her class at the Kilburn Royal, where she was second to Gainful. This was given her, subsequently, at the Leeds meeting of the Yorkshire Society. She was first, as a calf, at the Bristol Royal in 1878, and also at the Northallerton meeting of the Yorkshire Society the same year.

TULIP 4th, roan, calved February 26, 1878, bred by Mr D. Pugh, Manoravon, Llandilo, Carmarthenshire. This heifer is of nice quality and pleasant to the hand, with a good coat of a good colour. She was fourth in the yearlings' class at the Kilburn Royal in competition with Gainful, as above mentioned, but subsequently, at Manchester, she was placed above the Kilburn champion by the award of an umpire. She is an undoubtedly good heifer of considerable promise.

AZUCENA, roan, calved August 1876, bred by Mr F. J. S. Foljambe, Osberton Hall, Worksop, Notts. A good heifer, very thick and squarely built, very fat, and of rather plain character. Her horns spoil the look of her to a great extent. She was first in her class at the Kilburn Royal, again at the Stamford meeting of the Lincolnshire Society, and second at the Leeds meeting of the Yorkshire Society, in 1879.

ANNETTE, white, calved in June 1875, bred by Mr J. S. Bult, Dodhill House, Taunton, Somersetshire. A cow of very great substance ; her breadth across the hips and back is extraordinary, and, besides many points of corporeal excellence she is of good character. She was first in the cows' class at the Exeter, Bath and West, and third at the Kilburn Royal. She was second at the Bath meeting of the Bath and West in 1877.

CARNATION 4th, roan, coming five years old, bred by Messrs W. Hosken and Sons, Loggans Mill, Hayle, Cornwall. This is a very thick and fleshy heifer, with excellent coat of hair and a mellow hide —an exceedingly useful sort of shorthorn. At the Bristol Royal in 1878 she was placed third in her class, and at the Exeter, Bath and West in 1879 she was second. At the Kilburn Royal a high commendation was all she could obtain, but the awards on that occasion do not appear to indicate the general opinion of an animal's showyard merits.

INNOCENCE, roan, coming five years old, bred by Mr G. Ashby Ashby, Naseby Woolleys, Rugby. This is a well-made animal, of nice quality, but too fat for breeding purposes. She has had a calf, which "lived but a short time," and at the Woodstock meeting of the Oxfordshire Society she had the faintest possible show for milk. Yet she defeated Lady Carew 3rd on that occasion, taking the Champion Cup as the best shorthorn female in the yard. At the Wellingborough meeting of the Northamptonshire Society in 1879 she took a second prize, as she did at the Northampton meeting of the same Society in 1878. At the Bristol Royal in 1878 she took a reserve number in her class, but at Kilburn she was unnoticed.

JEMIMA 4TH, red and white, calved July 1876, bred by Mr A. Brassey, Heythrop Park, Chipping Norton, Oxfordshire. Jemima 4th is a thick-fleshed heifer of steer-like character, a butcher's beast in more ways than one, as she has not yet produced a calf, nor shown any likelihood of so doing. She has now grown plain on the rump and bare on the huggins. She was placed fourth at the Kilburn Royal, whereas, in 1878, she was first in her class, as a yearling, at the British Royal and the Oxford Bath and West, and first as a calf at the Liverpool Royal in 1877.

HEREFORDS.

BULLS.

GRATEFUL (4,622), six and a half years old, bred by Mr Aaron Rogers, The Rodd, Kington, Herefordshire. This is an extraordinarily good animal, and seems to improve as he gets older. His forehand is as near perfection as can be imagined ; deep and full in the brisket, great width through the shoulders, crops, chine, and ribs behind shoulder, all as good as it is possible to be. His back and loin are equally good, but his quarters are rather drooping, and he is light in the outside flank and thigh ; this, with hocks too close together, is about all that can be said in disparagement of this excellent bull. At the Oxford Bath and West, in 1878, he defeated the best Hereford bulls of the year, Mr Taylor's Thoughtful, and Mr Thomas's Horace 2nd, and obtained the Champion Sweepstakes prize as the best bull in the yard, defeating Sir Arthur Ingram, the shorthorn with which he had to contend. In fact, the Hereford was so good where the shorthorn was defective that the latter had no chance to win fairly. But the fact of his losing may, perhaps, be more correctly attributed to the fact of the shorthorn judges being in a hopeless minority on that occasion. At the Hereford meeting of the Herefordshire Society in 1879 Grateful was entered as one of a family group, but could not be exhibited, on account of the death of one of the animals entered with him. At the Kilburn Royal he won the £50 champion prize as the best Hereford bull in the yard, and he then looked fresher and better than at Oxford the previous year.

THOUGHTFUL (5,063), over five years old, bred by Mr Wm. Taylor, Showle Court, Ledbury. At the Hereford meeting of the Herefordshire Society, in 1879, this noted bull was exhibited in a family group, with an old cow and her young calf. At the Liverpool Royal in 1877 he was first in his class; at the Oxford, Bath and West in 1878 he was second to Grateful; at the Bristol Royal the same year he was first in his class, Grateful being absent; and similar circumstances occurred at the Exeter, Bath and West in 1879. At the Kilburn Royal he was once more second to Grateful, as mentioned above. The quality and symmetry of this animal are excellent, and the position he has always been able to command in the showyard, when competing with animals of merit, is in itself a guarantee that he is a Hereford of the very front rank.

HORACE 2ND (4,655), five and a half years old, bred by Mr John Price, Court House, Pembridge, and now in the possession of Mr T. Thomas, St. Hiliary, Cowbridge, Glamorganshire. This is another noted showyard bull, of first-rate quality. His hide and coat are all that could be wished for in a Hereford, and the same may be said of his style and character. Of late, however, he has grown rather uneven. He was second to Thoughtful at the Liverpool and Bristol Royals, in 1877 and 1878, but was defeated at the Exeter Bath and West in 1879 by Bedford 2nd, and was commended at the Kilburn Royal.

BEDFORD 2ND (4,338), over six years old, bred by Mr T. Fenn, Ludlow, Shropshire, and now in the possession of Mr J. E. Best, Tremeer, Fowey, Cornwall. This is a big bull, and was shown in very high condition—too fat, indeed. At the Exeter Bath and West in 1879 he was second in his class to Thoughtful, and at the Kilburn Royal he obtained third prize, being again placed before Horace 2nd, as at Exeter.

CUPID (5,284), five and a half years old, bred by Mr J. H. B. Lutley, Brockhampton, Worcester. This is a fairly good Hereford, but not one of the front rank. He was highly commended at the Exeter Bath and West, and the reserve number at the Kilburn Royal. At the Hereford meeting of the Herefordshire Society in 1879 he was exhibited amongst a family group to which the first prize in the class was awarded. But this success was probably due to the cow Teacher 2nd, which was shown with him.

ANXIETY, rising three and a half years old, bred by Mr T. J. Carwardine, Stockton Bury, Leominster. This is a good and improving animal. His record hitherto has been an exceedingly good one. Commencing as a calf at the Liverpool Royal in 1877, he took first prize; as a yearling at the Oxford Bath and West and at the Bristol Royal in 1878 he took second prizes; at the Exeter, Bath and West he was placed second to Goldfinder, but at the Kilburn Royal a month later this decision was reversed, and Anxiety obtained the first award, whilst Goldfinder was only highly commended. He will likely be seen and heard of again.

CONJURER (5,264), coming two and a half years old, bred by Mr J. Hungerford Arkwright, Hampton Court, Leominster. The showyard successes of this animal have been hitherto complete. At the Oxford Bath and West and the Bristol Royal in 1878 he obtained first prizes as a calf; at the Exeter Bath and West and at the Kilburn Royal in 1879 he took first prize sa a yearling; and at the Hereford meeting of the Herefordshire Society he was also first in his class. This is a very promising young bull, of good quality and built on a good scale, and he has fairly earned all he has yet obtained.

COWS.

LEONORA, nearly four and a half years old, bred by Mrs Sarah Edwards, Wintercott. This is certainly the best showyard horned animal in the United Kingdom, and presumably in all Europe. As it is not likely they have one as good either in America or Australia, it will scarcely be out of place to say that Leonora stands, by implication, the best horned animal in the whole world at the close of 1879. If there is a better it is time to bring it forward in competition, or for exhibition, at the same time. She certainly is in very high condition, and a great deal too fat for ordinary purposes. But she is as level and perfect as an animal can well be, and never looked so well as at the present time. Notwithstanding her high condition she is doing her work as a breeder, and when she is withdrawn from the showyard her like may never again be seen. When exhibited as a calf at the Birmingham Royal she was placed second to Beatrice, another of Mr Edwards' breeding, but on no other occasion. She has taken first prizes at each meeting of the Royal and Bath and West since 1876, and at many county meetings beside. At the Oxford Bath and West she took the Champion sweepstakes prize as best cow or heifer in the yard, there being no shorthorn that could compare with her, Mr Marsh's Diana, good as she was, being a long way behind. At the Kilburn she took the £50 Champion prize as the best Hereford cow or heifer in the yard, and has taken Champion prizes wherever they have been offered for the competition in which she has taken part.

SPANGLE 3RD, three and a half years old, bred by Mrs Sarah Edwards, Wintercott, Leominster. This heifer is of good quality, style, and character, but a very long way behind Leonara. At the Oxford Bath and West she was placed first in her class, and second at the Bristol Royal in the same year. At the Exeter Bath and West and the Kilburn Royal she was also placed second in her class, and also at the Hereford meeting of the Herefordshire Society, in 1879.

TEACHER 2ND, four and a half years old, bred by Mr J. H. B. Lutley, Brockhampton, Worcester. A fairly good Hereford—good but not particularly showy. At the Bristol Royal she was third; at the Exeter, Bath and West second; and at the Kilburn Royal third. She undoubtedly won the group prize at the Hereford meeting of the Herefordshire Society, as she was the best animal of the three.

LANCASHIRE LASS, three and a half years old, bred by Mr Wm. Taylor, Showle Court, Ledbury. This is a first-rate Hereford—long, level, and of good substance, with a capital coat of hair. She was first in her class at the Exeter, Bath and West and the Kilburn Royal in 1879; and took second at the Liverpool Royal in 1877. She was also first in her class at the Hereford meeting of the Herefordshire Society in 1879.

ABIGAIL, two and a half years old, bred by Mr Hungerford Arkwright, Hampton Court, Leominster. First in her class at the Kilburn Royal, and second at the Exeter Bath and West in 1879; and third at the Bristol Royal in 1878.

GAYLASS 4th, two and a half years old, bred by Mr Hungerford Arkwright, Hampton Court, Leominster. First in her class, before Abigail, at the Bristol Royal 1878, and at the Exeter Bath and West in 1869; but at the Kilburn Royal these decisions were reversed, and she was put second to Abigail. Both are good heifers and good Herefords.

ANTOINETTE, one and a half year old, bred by Mr J. Hungerford Arkwright, Hampton Court, Leominster. A very promising heifer, which took first prizes as a calf at the Exeter Bath and West and the Kilburn Royal; also first in her class at the Herefordshire meeting of the Herefordshire Society, in 1879.

CHERRY 24TH, rising three years old, bred by Messrs Green, Marlow Lodge, Leicestershire. A heifer of excellent quality and good Hereford character, long, broad, deep, and level. She was placed first in her class at the Ludlow meeting of the Shropshire and West Midland Society in 1878, and defeated Abigail and Gaylass 4th at the Hereford meeting of the Herefordshire Society in 1879. She was not exhibited at Exeter or Kilburn.

NANCY 2ND, rising three years old, bred by Mr T. Myddleton, Llynaren, Clun, Shropshire. This is a rather shorter heifer than the preceding, but is very thick and good all over. She was placed second to Cherry 24th at the Hereford meeting of the Herefordshire Society, and also defeated the two noted prize-winners, Abigail and Gaylass 4th. She has not been exhibited at any Bath and West or Royal meetings.

DEVONS.

SIRLOIN (1,443), over five years old, bred by Lord Falmouth, Tregothnan, Probus, Cornwall. This bull is well named, having an excellent back and loin, is very level, and of excellent quality.

LORD NEWSHAM, over three years old, bred by Mr Walter Farthing, Stowey Court, Bridgewater, Somersetshire. Champion Devon bull at the Kilburn Royal. He is a bull of excellent quality, very thick through his shoulders, of great substance all over, level, and taking.

PRETTYFACE, seven years old cow, bred by Mr Walter Farthing. Champion Devon female at Kilburn, and winner of very many first prizes and Champion prizes at the great shows. She is a perfect model of a Devon, small, but of the finest possible quality. Probably the next best showyard animal to the Hereford cow Leonora in all the country.

TEMPTRESS 8th, three and a half years old, bred by Mrs Maria Langdon, Flitton Barton, North Molton, Devonshire. This heifer, with others of the same name and family bred by Mrs Langdon, are excellent specimens of the Devon bresd.

SUSSEX.

YOUNG HARTLEY, five and a half years old, bred by Mr G. Smith, Paddockhurst, Crawley, Sussex.

SIR WILLIAM, three and a half years old, bred by Mr Louis Huth, Possingworth Manor, Hawkhurst, Sussex. Both these bulls took first prizes in their respective classes at Kilburn.

OXFORD, over two years old, bred by Mr J. S. Hodgson, Haslemere, Surrey. Took the Champion prize at Kilburn as the best Sussex bull.

BOUNCER, nearly eight years old cow, bred by Mr James Braby, Maybands, Rudgwick, Sussex, winner of the Champion prize at Kilburn as the best Sussex female.

RIVAL, over three years old, bred by Mr Braby, first in her class at Kilburn.

PEACE and **FAMOUS**, two two-year-old heifers, bred by Messrs J. and A. Heasman, Angmering, Sussex, first and second in their class at Kilburn.

LONGHORNS.

PRINCE VICTOR, nearly six years old, bred by Mr Shaw, Fradley Old Hall, Litchheld, exhibited at the Kilburn Royal by Sir F. W. Fitzwygram, Bart., Leigh Park, Havant, Hants. A long, handsome bull, deep but rather narrow in the quarters, and with many good points peculiar to the breed. He took Champion prize as best longhorn bull at Kilburn.

FAREWELL, nearly five years old, bred by Mr Barbury, Kenilworth, and now in the possession of Mr Rd. Wall, Thulston Grove, Derby. He was third at the Kilburn Royal, and first in the miscellaneous class at the Dairy Show in 1879.

CELIA, two and a half years old, heifer, bred by Mr Rd. Wall, Thulston Grove, Derby. First in her class at the Kilburn Royal in 1879.

SHEEP AND PIGS.

SHEEP.

IT seems merely the repetition of a truism which applies almost to everything, to say that the past season has been a bad one for the flock masters. They have only shared in the general misfortune. In the first place, the price of wool has hardly exceeded that of mutton, and thus the fleeces have been scarcely worth the clipping. Then again, the pastures have been marshes, and those who have sheep-runs on the hillsides have only missed the standing pools to be more exposed to the continual cold winds. Cold and damp have done sad havoc, and consequently sheep are ragged, scraggy, and rotten. Happy in such times are those animals whose destiny is the showyard, and whose life is one of exhibition. To them, indeed, the chilling blasts are tempered, and the fell influences of inclement weather—except at ill-fated Kilburn—are not allowed to come. But the public representatives who are periodically exposed to the sharp criticisms and sharper "proddings" of admiring crowds are but a small minority. In England alone last year (1879) there were 18,445,522 sheep, being no less than 75.3 to every 100 acres of crops, fallow, and grass in the country. Compared with these figures, the numbers entered at the various shows is infinitesimal. At each of the great meetings—which are few—each particular breed has its half-a-dozen particular supporters, and the principal interest lies in the fluctuating success of one or two "eminent breeders," whose animals are closely matched. Far be it from us to decry agricultural societies or their prize lists, but the absurdity of supposing that the competing animals represent in any degree the mutton and wool produce of the country must be self-evident.

During the past season Southdowns have fully maintained the position which perhaps must be granted them of being the fashionable breed—the shorthorns of the flocks. Gentlemen-farmers, headed by the heir-apparent and the Duke of Richmond, cultivate them with remarkable success. The fact, however, that Mr William Rigden, of Ashcroft, after taking the two prizes for shearlings at Exeter, was able to carry off first in a wonderful class of 77 entries at Kilburn, shows that practical farmers also believe in the breed, and are able to hold their own with it. Lord Walsingham is very hard to beat, and came second to Mr Rigden with several commendations, while the third prize was taken by the Prince of Wales. There was an extraordinary entry of twenty pens in the ewe class, every lot being noticed by the judges. Mr J. J. Colman, M.P., was first, and Messrs Heasman second, while the third prize again went to Sandringham. A new class for lambs was introduced at Kilburn, and though not all good throughout, the pen of the Prince of Wales, which took first prize, was excellent.

The ancestral Leicesters, from whom so many "improved" varieties have sprung, are generally more select than numerous. Mr George Turner, jun., has for some years past been alone in the Bath and West of England classes, but this year several rivals appeared, and he had to divide the honours with Mr Tremaine, of Polsue, who had previously swept the board at Devonport. At Kilburn the chief prize-winners were Messrs Turner, Brown, Hutchinson, Jordan, and Tweedie.

The Cotswolds are always an attractive feature of exhibitions where they appear, the spirited competition between Messrs Gillett, Brown, and Swanwick keeping the specimens up to a high and uniform standard of excellence. The awards simply ring the changes on the three names above mentioned.

Lincolns, which appear to be superseding the Leicesters in the favour of many farmers, were well to the front at Kilburn, Mr H. Smith being successful in the ram classes, as he was afterwards at the local show at Ashby-de-la-Zouch. The flocks of Aylesby, Panton, Medham Hall, and others, have maintained their reputation, although it is said that the Lincolnshire sheep sales of 1879 have made an average of £6 less than in the previous season.

Shropshires have held their own in the showyards, although Lord Chesham's representatives have been wanting. At Exeter there were only thirteen entries altogether, among which, however, those of Messrs Mansell and Knowles maintained the reputation of their flocks; at Kilburn they were very numerous, mustering 102 yearling rams. Mrs H. Smith after taking first prizes at Kilburn, Worcester and Manchester with a fine pen of shearling ewes, sold them (at 20 gs. per head), together with all the rest of her sheep, and the scenes of her former triumphs will now know her no more.

Hampshire down still continues to rise in public estimation, and is now one of the favourite of the modern "crosses." In addition to the union of hardihood and size with good quality, this breed shows a great aptitude for turning in money early. In fact, the breeders prefer a lamb class to an old ram class, and will fill the one and ignore the other. Mr Morrison, whose ram in 1878, at Oxford, was pronounced by two competent judges to be the best ever seen by them, again occupied the premier position, but Messrs Moore, Bennett, and Reed are never far behind, while the whole of some dozen breeders make a remarkably level show.

That cross of downs and Cotswolds established by the Gilletts and Druces about half a century back, and now known as Oxfordshire Downs, is another popular mixed breed. It has, of late, produced some remarkable animals, and the impress of Mr Milton Druce's ram Freeland, which was hired by Mr Treadwell two or three seasons back, has placed the flock of that gentleman first in many a well-filled class. Messrs Brassey, Arkell and Adams divide the honours with Upper Winchendon.

To enumerate all the noteworthy animals, or even all the deserving breeds, would be manifestly impossible: suffice it to say that the Devon long-wools, the Romney Marsh, the horns, and the Exmoors, as well as less known varieties, all sent specimens, at any rate to Kilburn, fit to maintain the reputation of their respective owners and their breeds.

PIGS.

Showyard swine are by no means an attractive subject. When breeders think more of quality and less of size, more of bacon and less of fat, when they aim more at an animal which it will pay farmers to keep, and less at an ungainly object which it disgusts rational men to look at, they will merit and obtain more serious attention. The fault of course lies more with the judges than the exhibitors, for, while the first prize goes to the largest monster, breeders will naturally feed up to the level. Perhaps some day a bold man may award the honours with a view to the destiny and utility of the animals; and exhibitors will then soon lessen the size of their meal-tubs, and begin to supply an article for which the demand is the greatest, instead of for one for which it is least. The prices offered by a leading firm of bacon factors in Wiltshire during the past year were highest for pigs between 7 and 9 score, and decreased 6d. per score for heavier weights. The curers do not require small-framed pigs, alleging that they are almost all fat, but wish to encourage large pigs—particularly Berkshires—which will carry a good proportion of lean meat if not prematurely forced. There are many old-fashioned folk who still swear by the "blacks with white points," and in the hands of such breeders as Messrs Heber, Humfrey, Russell, Swanwick, Arthur Stewart, and Richard Fowler, there is no fear that they will degenerate from any new-fangled ideas about handsome appearance and fine quality. The model pig is the one which will make the best bacon and pork, not that which will weigh heaviest in the scales, or look sleekest in the pens.

DAIRY FARMING OF THE YEAR.

THE past year will long be memorable as the climax of a series of disastrous seasons. For once it would scarcely be an exaggeration to say that seed-time, harvest, and summer have all failed, while winter has been with us always. Rain and frost have been the principal features of the meteorological records, and the wet and cold have been fatal to all outdoor operations. The common report on the crops has been "failure," and hay, grain, and roots have been merely rivals in misfortune. The worst sufferers from the weather have been the corn-growers of the heavy clays, but their brethren of the grazing districts have had little cause for congratulation. The dairy farmers, many of whose holdings are on light uplands, might have been best off, but that other causes have combined with the frowning skies to prevent any success in agriculture. Last year 3,765,376 cwts. of cheese and butter were imported to this country. This is more than an enormous quantity; it is a pregnant fact. It means that in the very department of production, where England is fitted by nature to excel all the nations of the earth, she supplies less than half the requirement of her people; it means that the dairy farmers of the old country are being hard pushed by those who have imitated their methods; it means that in "perishable" articles of food foreign competition is steadily increasing. For these figures also imply that the imports of cheese and butter have multiplied five times within twenty years. Nor is the increase in quantity alone; if it were, it would soon cease.

But whereas the value of the cheese and butter imported in 1859 was £3,119,323, in 1878 it was £11,741,927; the whole of the difference being in cheese. Foreign—and more particularly American—cheese has so improved of late years as to overcome in a great measure that most bigoted of all prejudices—the English taste. Thousands are now only too glad to get cheese for sixpence or sevenpence as good as that which is priced at tenpence. They may love their neighbour after a fashion, but not enough to pay 3d. or 4d. per pound more than they need, because the dearer article is produced at their doors. And thousands more are buying cheese which has crossed the sea, while they flatter their insular pride that they are supporting home production; "for," reasons the 'cute retailer, "if they will not look at the cheese at 8d. if I call it American, but will purchase it greedily for 10d. if I call it Cheddar, why should they not have their own way?" When we consider this fact, and remember that in bad times the consumption of the best and higher-priced cheese decreases, we need not charge all the ill-fortune of the past season for dairy farmers upon the long account against the weather. And those who—like the present writer—live in a dairy district have not far to seek for proofs of bad times and slack trade. One well-known farmer whose Cheddars are sought for by the merchants informed us that the prices offered him this season were nearly 20s. per cwt. less than those he obtained last year. As a result, he has made very little this year, but has thought it more profitable to send butter to the nearest shops at fifteenpence per pound. Another cheese maker, rather than go on making at the present year's prices, took a small shop in the nearest market town for the sale of milk, and actually conveyed his milk by road twice a day a distance of six or eight miles, and then undersold the ordinary milkmen. Such instances are only representative of the straits to which the English cheese dairies have been reduced. Of course, to a certain extent this policy has worked a temporary cure in the comparative scarcity, and consequent rise in price, of good home-made cheese at the end of the season. But the bare fact that for a whole season a large number of the private cheese tubs of the country have been almost empty, is in itself a gloomy summary of the year's dairy-farming.

The slightest sketch of the dairy proceedings of 1879 would be incomplete without some allusion to the great success of two exhibitions, in each of which the practical exemplification of the English methods of cheese and butter-making was a prominent feature. Of the vast meeting of the Royal Agricultural Society at Kilburn it is as unnecessary as it is impossible here to speak at any length. It is of too recent a date to have faded from the minds of agriculturists, and there are at least two characteristics by which it will long live in the memory of all who saw it—its magnitude and its mud. The other exhibition was that held in October last at Islington by the Dairy Farmers' Association: a society which appears at length to have started upon as flourishing a career as the importance of its objects deserves. The two meetings are not comparable in many respects, but they resembled one another on one point—each was better supported by exhibitors than by the public; the shows were large, but the profits were small.

Among the appliances shown there was nothing of any great importance which had not been previously tested at the admirable dairy exhibition of the Royal Society at Bristol in 1878. De Laval's Cream Separator, for separating the cream from the milk by centrifugal force, was the greatest novelty in this department at Kilburn, and was shown again at work in the Agricultural Hall. The Swartz or Danish system of butter-making was again fully worked, the well-known churns, including Ahlborn's "Holstein," were practically tested; and cheese and butter were openly made in accordance with various English and Continental methods. But all these are fully described in the official and newspaper reports, and to them any who are still ignorant of the details of the newest dairy appliances may refer. At the Dairy Show in October, a very complete collection of American churns and butter-making machinery and appliances was exhibited by the Association, to whom they now belong.

All through the year the air has been full of remedial suggestions—many of them nostrums—for the alleviation of the bad time. If the dairy farmer adopted all the gratuitous advice which has been offered, his condition now would be considerably complicated; still there are plain lessons to be learnt from the year's events, which it behoves any thoughtful man to ponder. There are those who assert the factory system for cheese and butter making to be the panacea for all ills. These are co-operative times, and it is well for any man to seriously consider whether by sending his milk with that of his neighbours to one centre, and there employing skilful labour to deal with the whole with the most approved scientific apparatus, he may not make a higher and safer profit than by undertaking all the process and all the responsibility himself. Nor should it be forgotten that this system is the backbone of the American cheese trade, and no one can now afford to sneer at the quality of the article produced by our cousins across the Atlantic. At the same time it must be remembered that the genius of our race and that which has made English workmanship a name for excellence in the world, is independence of production. We cannot view unmoved the approach of a time when each isolated homestead shall cease to make its own peculiar cheese and butter, when the production of the wife or daughter of one farmer shall no longer compete in friendly rivalry with that of their neighbours, and when the proud excellence of a private dairy shall be merged in the general mediocrity of an associated company.

Attention has been called during the year to the fact that cheese-makers have of late trusted too much to artificial aids for drying their cheese, with a view to ripen it more quickly for market. There can be little doubt that a too great haste to turn over their money has resulted in a deterioration of their produce. The old mellowness and fat aged ripeness of a naturally dried cheese has been sacrificed to a greed for hurried gain. If these strictures are well grounded, the matter is serious. England has always produced, and can still produce—as her fat pastures were meant by Nature to produce—the finest cheese in the world. But foreign rivals are running her close, and nothing but the best will maintain her position now. Let the dairy farmers adopt all the modern aids and appliances for the lessening of labour, but never let them forsake the good old ways which have made their fame.

It has been widely suggested that in many cases the dairy farmer could make a better profit by the raw milk than by manufacturing it. Now, something like a million gallons of milk per diem are estimated to be consumed by the population of Great Britain, being rather more than one-third of the whole estimated produce. This is liable to increase every year, not only from the addition to the population, but from the extension of the use of milk as a dietary article. Allusion was made to a farmer who, during the past season, thought it more profitable to give up cheese making and carry his milk a distance of six or eight miles, and there sell it at less than the retail price. Such a state of things may be abnormal, but the absence of foreign competition at present—though we may not expect this advantage long—is one reason why farmers living within railway reach of our large towns should consider the advisability of selling their milk. The fact that the milk supply of London is drawn largely from places as remote as Derby and Leicester, proves that the practice may pay a considerable freightage and still be profitable.

There is no doubt that the dairy farmers of this country, as a class, are fully alive to the considerations which are pressing upon them from all sides, and we may confidently trust that their own good sense and intelligence, together with more favourable weather—and perhaps some necessary legislation—will conspire to accelerate the advent of more prosperous times.

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The Poultry Yard.

IN this letter I hope to be able to show how the poultry-yard may be made a source of pleasure and profit, and I trust these remarks may not be lost upon my readers. I will first glance at the present appliances to be found in most homesteads. A rough enclosed shed is called the *fowl-house*; it is generally most properly named, for anything more *foul* and offensive it is scarcely possible to find. Two or three old ash-poles have been nailed across haphazard—generally most ingeniously arranged that the droppings of each row of fowls shall fall on the backs of those below them; a row of dilapidated boxes, called nests, oftentimes with the hay and straw of the previous year or more left in, with old shells of the former hatchings, very often the remains of a smashed rotten egg adhering to the straw; the hay or straw full of vermin. When a hen, despite of all these horrors, has sat herself, the nest is so exposed that half the other hens desirous of laying fight the occupant, and incessantly disturb her in her process of incubation. Is it then to be wondered at that hens *steal* their nests, as it is called, and wander into the hedges and rickyards and sit themselves, and become a prey to foxes, polecats, or weasels? No provision is made for giving poultry clean water, and the result is the fowls drink the sewage-water of drains, and especially the drainage-water from the stables and manure-heaps, than which nothing can be more injurious, especially to young chickens, producing "gapes" and diarrhæa, with other kindred disorders. As to feeding, I might say "starving" is the rule, and the bulk of the poultry may get their living as they can. The only chance for our poor feathered friends under these circumstances is for them to roost in the cart-hovel and implement-shed, where they probably have the satisfaction of breathing pure air, and have some slight revenge for the neglect shown them by contriving to smother the implements beneath them with the produce of the rickyard and pigstyes.

All this can be easily remedied—by utilizing the existing fowl-house, by cleaning it out, pecking up the floor, throwing some slackened lime and road-scrapings over it about 3 inches thick. Take away the nests and place them on the ground round the house, get some fir-poles, saw them down the middle, place them the round side uppermost, and fix them to a sloping frame, so that the perches may be like a widened ladder, and at such a distance apart as that no row of roosters should perch over the others. Let there be some clean straw laid down, and see that it is removed once a week and replaced with clean straw, and I have no hesitation in saying that this manure will well repay itself, as being better than any made from cattle or pigs. Get three or four small iron troughs put round or near the fowl-house, and keep them supplied with clean water, the rust from the iron being beneficial to them. The eggs should be gathered up daily, and then you may ensure their freshness. The place for sitting hens should be away from the hen-house—an old fish-pad or small basket, or a butter-tub, with a lid on, makes a good nest for sitters. The hens should be taken off every morning to feed and for water, and put back again on their own eggs, when more than one is sitting at a time. I strongly deprecate expensive houses and appliances, as I believe them to be follies.

As to food. You are all aware that on all arable farms there is a considerable amount of tailing corn. This should be all mixed together, as also some buckwheat and good sound maize with it, and given to them in the morning. After the poultry have been out for an hour or so they will have had time to have foraged about in the yard and out-buildings, and will soon come back to their call, and then they should be left to themselves; but if prize birds are kept they must be fed oftener, say twice or thrice a day. I calculate the cost of keeping a fowl from 1d. to 1½d. per week. Ducks would cost 2d. and geese about 4d. per week. If a hen, then, costs 5s. per annum, and she would lay on an average during the year 100 eggs, which at 1d. each comes to 8s. 4d., and an average of five chickens should be reared in addition, which at 2s. 6d. each would be 12s. 6d.; but as the chickens would cost in food about 1s. 6d. each, leaving 5 per cent. profit, each hen would bring per annum 13s. 4d., from which should be deducted 5s., the cost of hen keep; profit, 8s. 4d. And as I consider a farm of 100 acres ought to keep forty hens and four cocks, there would be a profit on the hens of £16 13s. 4d., and from the ducks—say one drake and three ducks—each duck laying forty eggs, and rearing under hens eight each, would give twenty-four ducks, at 3s. each, £3 12s., besides the sale of a score of eggs at 2d. each, 3s. 4d. for each duck, or 10s. for the three, making £4 2s.; deducting the cost of four at 2d. per week each, £1 14s. 1d., leaving £2 7s. 4d., which added to the above profits would make a total of £19 0s. 8d., or nearly 4s. per acre. This is what an ordinary farm with reasonable management could do. I say nothing of geese and turkeys; but a considerable addition could be made to this, if these birds could be made part of the stock; but woodlands for the latter, and water for the former would be desirable. But there is another consideration to be taken into account, *i.e.*, the great value of poultry in keeping down insects, grubs, slugs, &c., and the picking up of the seeds of weeds; and when that is added, I have every belief that a tolerably well-managed poultry-yard would make nearly 6s. per acre. In choosing the breeds most suitable for a farm, soil and climate must be taken into consideration, and I refer readers to "Hints on Rearing and Management of Poultry"—a small publication describing the varieties kept on the Prebendal farm.—J. K. FOWLER.

Politics.

THE year 1879 has been exceptionally infertile as regards legislation. The statute book is the thinnest since the Queen's accession, and of this sparse volume the Army Discipline Act occupies ninety-four pages. With relation however to agricultural and country interests, the twelvemonth has been far from uneventful. The need for the appointment of an agricultural minister was strongly affirmed by the House of Commons, but the Government were compelled to oppose the resolution through its mover refusing to give up the perfectly illegal stipulation that the agricultural minister should have a seat in the Cabinet. The law knows no such institution as a cabinet, and therefore strict compliance with the terms of the resolution is in the highest degree unlikely. From hints, however, given by ministers in some recent speeches, it appears probable that 1880 will see the creation of an Agricultural Department of the Board of Trade, similar in scope of action to the Agricultural Bureaux of France, Austria, Italy, and the United States. But the most important event of the Session was the appointment of a Royal Commission, to inquire into the causes of agricultural distress. The motion for this appointment was made on July 4 by Mr Henry Chaplin, M.P. for Lincolnshire, and seconded by Mr Thomas Brassey, M.P. for Hastings. It received the warm support of the Government, and notwithstanding some bitter attacks and criticisms from Mr John Bright, was agreed to unanimously in a full House. A month afterwards the Government issued their list of Royal Commissioners of which no more need here be said, than that the names were fairly satisfactory as far as they went. Looking over the list of the twenty commissioners, most persons were rather struck with the names omitted than with those included therein, but this was to some degree compensated for by several excellent appointments of sub-commissioners. Mr Clare Sewell Read, M.P., and Mr Arthur Pell, M.P., proceeded to America to investigate agricultural prospects across the Atlantic, and from their report more practical advantage is generally anticipated than from the home inquiries into the state of farmers, and the operation of various real property laws. The purely agricultural statutes of 1879 are very few in number, and unimportant in tenor, but some measures of interest to agricultural residents generally have become law. By chapter xxiii. the preservation of hares in Ireland is provided for. The close time is fixed from April 20 to August 12, but the Lord Lieutenant has power to vary the time in exceptional seasons. Chapter xlix. relates to the summary jurisdiction of county magistrates. The Act commences January 1, 1880, and its main provisions are as follows:—The court may mitigate certain legal sentences: a scale of imprisonment for non-payment of money is fixed; costs in the case of small fines are regulated, enforcement of recognizances is arranged for, summary trial with consent of party accused is allowed, and thus many trials by jury will probably be avoided. Imprisonment in cases of cumulative sentence is not to exceed six months. Special provision for distress warrants is made. A register of court of summary jurisdiction is established, and a general power of making rules is confided to the Lord Chancellor. The second part of this statute is devoted to the amendment of procedure, especially with regard to appeals. Chapter xlii. is devoted to the valuation of lands in Scotland, and provides for the appointment of county valuation committees. Chapter xxxi. is an Act for which we are indebted to Mr Marten, M.P. for Cambridge University. It provides for interments in country districts, and may be regarded as a fair settlement of the burial disputes which have recently given so much trouble in agricultural districts. Its principal provisions are as follows:—1. Local bodies, boards, and vestries are empowered to buy land for a general cemetery, and to maintain such cemetery at the expense of the parish. 2. The Act (42 & 43 Vic. c. xxxi.) is made to fit in with and agree with the Public Health Act (38 & 39 Vic. c. lv.). The other statutes of the year, calling for more or less note, are the Habitual Drunkards Act (c. xix.); the appointment of a Public Prosecutor Act (c. xxii.); the Food and Drugs Act Amendment Act (c. xxx.); the Army Discipline Act (c. xxxii.); the Commons Act Amendment Act (c. xxxvii.); and the Irish Education Act (c. lxv.). The County Government, Valuation, Indictable Offences, and Bankruptcy Bills are remnants from 1879 which Legislation in 1880 must be prominently concerned.

POSTSCRIPT.—To make the inquiry on agriculture a wide and exhaustive one, Government appointed the following gentlemen as Assistant Commissioners; they were appointed direct by the Cabinet, and not, as it is supposed they were, by the Royal Commission

England and Wales,

Mr John Coleman—Northern District, comprising the following counties, viz., Cheshire, Cumberland, Durham, Lancashire, Northumberland, Westmoreland, and Yorkshire.

Mr Andrew Doyle—Western District, comprising Gloucester, Hereford, Monmouth, Oxford, Salop, Stafford, Warwick, Worcester, and Wales.

Mr S. B. L. Druce—Eastern District, comprising Bedford, Buckingham, Cambridge, Derby, Essex, Hertford, Huntingdon, Leicester, Lincoln, Middlesex, Norfolk, Northampton, Nottingham, Rutland, and Suffolk.

Mr W. C. Little—Southern District, comprising Berks, Cornwall, Devon, Dorset, Hants, Kent, Somerset, Surrey, Sussex, and Wilts.

Ireland.

Professor Thos. Baldwin and Major Robertson, J.P.

Scotland.

Mr G. J. Walker—Northern District, comprising the counties of Aberdeen, Banff, Caithness, Clackmannan, Dumbarton, Elgin, Fife, Forfar, Inverness, Kincardine, Kinross, Nairn, Perth, Ross and Cromarty, Stirling and Sutherland.

Mr James Hope—Southern District, comprising Argyll, Ayr, Berwick, Bute, Dumfries, Edinburgh, Haddington, Kirkcudbright, Lanark, Linlithgow, Peebles, Renfrew, Roxburgh, Selkirk, and Wigtown.

United States and Canada.

Mr C. S. Read, M.P., Mr A. Pell, M.P., and Mr John Clay, jun.

Mr H. Jenkins, secretary of the Royal Agricultural Society of England, and Mr C. L. Sutherland, of Coombe, Croydon, were appointed to take charge of the reports to be made upon European agriculture.

The Members of the Royal Commission on the Causes of Agricultural Distress.

The Duke of Richmond, President of the Council, was born February 27, 1818, succeeding to the dukedom in 1860, after occupying a seat in the House of Commons for twenty years as representative of West Sussex. A Conservative and a prominent member of the present Government, the Duke of Richmond would be well fitted to preside over the Royal Commission even were he not a practical agriculturist, sportsman, and breeder of stock. His views on the subject of reciprocity are understood to be of an open character. The Duke of Richmond holds 286,407 acres, in five counties, and his landed property brings him in a yearly rental of £80,000. His Grace may be considered as peculiarly representing the county of Sussex.

The Duke of Buccleuch was born November 25, 1806, and succeeded to the title while still a minor. He was Lord Privy Seal in 1842, and he vacated the office in 1846 to become President of the Council. He has been a frequent exhibitor at agricultural shows, and has for many years devoted his close attention to the breeding of stock. The Duke of Buccleuch holds 459,260 acres, in twelve counties, and his estate roll exceeds £230,000 a year. His Grace may be considered as peculiarly representing the lowlands of Scotland. The Duke of Buccleuch has been through life a staunch Tory. He acquiesced in, rather than became a convert to, the ideas of free trade.

Earl Spencer was born October 27, 1835, succeeded to the title in 1867, and, after serving as Groom of the Stole to the Prince of Wales, was raised to the dignity of Lord-Lieutenant of Ireland. In this post he was moderately popular. He is a Liberal and a free-trader. Industrious, and well acquainted with administrative routine, Earl Spencer will add to the business capacity of the Commission, even if he brings to its deliberations no original ideas. He may be considered as peculiarly representing Northamptonshire. He owns 24,254 acres, in six counties, and they bring him in £42,000 a year.

Lord Vernon was born February 1, 1829, and succeeded his father in the title in 1866. He has always taken an interest in agriculture, has been president of the Royal Agricultural Society, and cordially worked over the French Peasants' Seed Fund. He is a Liberal and a free-trader. The counties of Derbyshire, Cheshire, and Stafford will have in him a special guardian of their agricultural interest. He holds considerable estates in the Northern Midlands, though not such vast possessions as those of his noble colleagues on the Royal Commission.

The Right Hon. G. Joachim Goschen, M.P., was born in 1832, and is of mixed German and Hebrew extraction. He is a practical financier, and is strongly interested in sundry banking and other commercial companies. He filled under the Gladstone Administration the dignity of First Lord of the Admiralty, a post for which his special fitness was as obscure as is the reason of his appointment on the Royal Commission. Although a Radical on some questions, he is Conservative in his views of the county franchise and of the custom of primogeniture. This many possibly account for his present appointment. He is the minority member for the City of London. His personal interest in the land is slight, but he possesses a country house at Hawkhurst, in the Weald of Kent. He is a mild free-trader.

Mr Henry Chaplin, M.P., was born in 1843, and comes of one of the oldest untitled families in Lincolnshire. He is regarded as one of the most rising men of the Conservative party, and has recently been showing himself indefatigable in defence of the agricultural interest. As the proposer of the motion that was met by the appointment of a Royal Commission, he was entitled to his seat thereon. On the influence which he is able to exert on his colleagues will to a great extent depend the results, satisfactory or otherwise, of the present inquiry. His landed property amounts to 23,370 acres, bringing in a yearly rental of rather over £30,000. All his estates are situate in Lincolnshire. He is in favour of a fair and full investigation of the case of reciprocity against one-sided free-trade.

Colonel Kingscote, M.P., was born in 1841, and comes of an old Gloucestershire family. He is one of the few English Liberal county members, and he owes his seat in great measure to personal popularity and local influence. He is a practical agriculturist, and will be likely to render valuable assistance on the Commission. He is understood to have open opinions on the subject of reciprocity. Gloucestershire farmers will feel especial satisfaction in his appointment. Colonel Kingscote is a friend and relative of the head of west country proprietors, the Duke of Beaufort.

Mr. Hunter Rodwell, M.P., was born in 1816. He is a barrister, farms 200 to 300 acres in Suffolk, and has managed to secure a fairly well-known name among the farmers of Cambridgeshire. He professes a mild Conservatism, and on the subject of reciprocity is probably open to conversion. He will be a useful member of the Commission, but his opinion will probably be ranged on the side of "the biggest battalions," and we cannot in any case expect from him that independent action which Mr C. S. Read would have been able to take had he occupied a seat at the board. He has no residence in the county which he represents, his hóme being Ampton Hall, Suffolk.

Sir William Stephenson was born in 1811, and entered the Government service as a clerk in 1827. For many years the private secretary of Sir Robert Peel, he attained the position of Chairman of the Board of Inland Revenue in 1862. He retired from this office after forty-four years of Government service, and his merits were sufficiently high to secure for him a knighthood from Mr Gladstone, albeit Sir William Stephenson is himself a member of the Conservative party. Sir William is a well-known statist, and may be relied upon to give the Commission important assistance in the discovery of statistical facts, and precise evidence from witnesses and other persons making statements to the Board. Sir William Stephenson, however, has no direct or practical knowledge of agriculture.

Mr Mitchell Henry, M.P., was born in 1827, and brought up to the profession of a surgeon. He subsequently abandoned that calling and became a London merchant. Having taken up with the ideas of the Home Rule party, he succeeded in obtaining a seat in Parliament for County Galway. He is reported to be a good man of business, but he does not command the ear of the House of Commons. His appointment is probably due to the refusal of Mr Shaw to serve. Mr Mitchell Henry is a Liberal in general politics, and favours fixity of tenure, destruction of game, and other articles of the Radical programme.

Mr C. T. Ritchie, M.P., was born in 1839, and is a merchant trader of London. He is a moderate Conservative, and represents the Tower Hamlets. His appointment as a member of an agricultural commission is one of those things which we make no attempt to explain. Mr Ritchie has open opinions on the subject of reciprocity.

Mr Joseph Cowen, M.P., was born in 1830, and pursued in the North of England a mercantile career, until a few years ago, when he turned his attention to journalism, and became the proprietor of an influential daily newspaper at Newcastle-upon-Tyne. He is a man of great energy and strong opinions. A Republican in theory and an avowed Radical in home politics, he has yet been a fearless supporter of the Government in a spirited foreign policy, and especially in their opposition to Russia, a power for which Mr Cowen has all the hatred of the ancient Radical of the time of the Holy Alliance. Unless given as a reward for his having proved a sharp thorn in the side of his own party, it is difficult to understand the reasons that have induced the Government to place him upon the Royal Commission.

Mr Bonamy Price was born on May 22, 1807, and was educated at Worcester College, Oxford. Having succeeded in carrying off very high honours there, he obtained the post of assistant master at Rugby School. This position he held for many years, until, in 1868, the University gave him their Chair of Political Economy. He has frequently written "on the currency," and has been described by a well-known author as a "writer of brilliant dulness." He has advocated free-trade ideas with fanaticism, and favours a system of peasant proprietors, in opposition to the English system maintained by Lord Beaconsfield and Mr J. A. Froude.

Mr William Stratton, of Warminster, Wiltshire, is a large farmer and well-known cattle breeder. He takes active interest in all agricultural movements. He has been an important witness before Committees of the House of Commons on Cattle Disease, and has been one of the chief spokesmen on several occasions when deputations of agriculturists have waited upon the Government.

Mr Charles Howard, of Biddenham, Bedfordshire, is a member of the "Farmers' Club," and a practical agriculturist, known and respected; as a breeder of stock and as judge at the great shows, Mr C. Howard is acquainted with a very wide circle of farming friends. Being a Conservative in politics, he is on the opposite side to his brother, Mr James Howard, late M.P., of the Bedford Implement Works, and now chairman of "The Farmers' Alliance." Mr Charles Howard may be reckoned one of the mainstays of the Royal Commission, and if he would contribute to the inquiry his farm balance-sheets for the last ten years, they alone might do yeoman's service, indicating what skill and capital can successfully accomplish.

Mr Lennox Naper is an Irish landlord, whose name was one of the last to be announced, and with whose qualifications we are unacquainted.

Mr John Rice, of Charleyville, in the county of Cork, is reported to be a leading tenant farmer, well acquainted with Irish agriculture.

Who is **Mr John Clay,** out of whom the Cabinet has moulded a Royal Commissioner? It seems we were wrong in referring to him as a representative of the West of England, and of whom a contemporary speaks as of Piercefield Park, Chepstow, a gentleman with an ample fortune, and one of the partners in Bass's Burton's Brewery, and a farmer for *amusement.* (On the last score he might have represented a once large but decreasing body of agriculturists.) We now learn that the real "trusty and well-beloved" Commissioner **Mr John Clay** resides at Kerchesters, Kelso, is a member of the Scottish Chamber of Agriculture, of which he has been chairman, and therefore, is coupled with Mr Paterson for Scotland. He is a very large farmer, and a Liberal in politics, always having advocated a modification of the land laws, the abolition of hypothec, and compensation for unexhausted tenants' improvements, as well as the issue of leases to far occupiers.

Mr Robert Paterson, of Birthwood, is a member of the Scottish Chamber, but has not been president. A correspondent mentions that three farms of Rattery, Charleston, and Broadlean in Caithness, for some time held by Mr Paterson, are now advertised as to let, and asks the reason why? A question which does not concern us.

THE PROGRAMME OF THE ROYAL COMMISSION ON AGRICULTURAL DEPRESSION.

IT has been already stated that the Royal Commission on Agricultural Depression had agreed upon certain heads of inquiry into the agriculture of Great Britain and Ireland. The general heads of inquiry are :—

1. Condition of farms.
2. Condition of farmers.
3. The labourer.
4. Land laws.
5. Land tenancy.
6. Agricultural education.
7. Condition of estates.
8. Agricultural statistics to be furnished by the Board of Trade.
9. Returns of imports and exports of agricultural produce to be furnished by the customs; and
10. Importations of agricultural produce from foreign countries.

I. Investigations are to be made by the Assistant Commissioners as to condition of the farms in each district, under the following heads (for sub-heads to each of these, see A, *post*) :—

1. Arable farms (also see C and B).
2. Grazing farms (also see D).
3. Dairy farms (see also B).
4. Sewage farms.
5. Market gardening farms.
6. Hop farming.
7. Fruit-growing farms.
8. Hill and moor sheep farming (also see D); and
9. Poultry keeping on all classes of farms.

The following sub-heads for the above have been agreed upon :—

A.—1. Tenure (lease or otherwise) restrictions, if any, as to cropping and sale of produce.

2. Live stock, implements, rent, labour, seed, manures, and feeding stuffs.

3. Loans from bankers and others.

4. Cost per acre of growing each crop, and yield of produce per acre. Under the "cost" are included the questions of rent, rates, and taxes, seed, manures, cultivation by horse or steam power, labour, and tradesmen's bills and other expenses; while under the "yield of produce" are included the items of quantity of corn and other produce, and of price of corn and other produce.

5. Causes which diminish the produce, and causes which depreciate the prices. Under the former causes are bad seasons, imperfect cultivation, insufficient manure, game, want of capital, and supply and quality of labour. Under the second class of causes are included foreign competition, inferior quality of produce, diminished demand owing to bad trade, &c.

6. Causes which diminish profits, and probable remedies. Under the head of such causes will be considered the cost of carriage, adulteration of dairy and farm product, systems and cost of marketing and commissions to middlemen, and interest on loans. Under the head of probable remedies, consideration is to be had of (*a*) extension of tramways in country districts; removal of restrictions on the use of traction engines; railway rates; and (*b*) co-operation as to sales, and improved banking arrangements; reductions in charges, and commissions on sales.

7. Improvements, under which head will be considered landlords' improvements, tenants' improvements, increase of capital invested by tenants in machinery, especially in steam cultivation, thrashing and other agricultural machinery; and in the purchase of additional live stock, feeding materials, and artificial manures.

B.—Condition of dairy farms (in addition to head A). Under the head "Produce" the following questions will be considered :—

1. Number of cows kept per 100 acres.

2. Prime cost of cows, whether bred or reared on the farm, or purchased.

3. Yield of milk, butter, cheese, &c.

4. Utilization of whey, buttermilk, &c., including rearing and feeding of calves, pigs, &c.

5. Cost of food not grown on the farm.

6. Cost of labour in the dairy, including attendance and manufacture of dairy products, whether done by family or otherwise; also as compared with former years, and if cows are let, on what terms.

7. Mode of sales.

8. Commission on sales; and

9. Comparison of wholesale and retail prices.

Under the head "Yield" will be considered :—

1. Gross sums received for the dairy products.

2. Gross sums received for fat calves, pigs, or other results, from utilizing refuse.

3. Gross sums received for cast cows; and

4. Sales of other produce of the farm.

Under the head of "Manufacture of Dairy Products at Factories; Cost of Manufacture at Factories," the following matters have been put down for inquiry :—

1. Rent and description of buildings, plants, &c.

2. Cost of management and labour.

3. Cost and mode of conveyance of milk, including quantity per annum.

4. Cost and methods of distribution of dairy products, including commission.

5. Interest on capital.

6. Cost of purchased food.

7. Utilization of whey, buttermilk, &c., including rearing and feeding of calves, pigs., &c.

8. Organization and management of dairy factories in England.

9. Financial results up to the present time; and

10. Comparison of wholesale and retail prices.

C.—Under the heading "Condition of Arable Farms for Breeding or Feeding Purposes," inquiry will be made as to (*a*) sheep farming in arable land. Under this head the following questions are to be inquired into :—

1. Number of breeding flock per 100 acres, or number of stores annually bought.

2. Number of sheep sold, whether fat or lean, and at what ages.

3. Use of artificial food purchased.

4. Cultivation of special green food, other than grass and roots.

5. Recent alterations in systems of farming, due to high or low prices, wet or dry seasons, disease, &c., including results of laying down arable land to permanent pasture.

6. Systems and cost of marketing fat and lean stock, and wool.

7. Comparison of wholesale and retail prices.

8. Greater or lesser profits from breeding or feeding.

b. Cattle-keeping on arable land. Similar heads as to sheep farming on arable land.

D.—Under the heading "Condition of grazing farm," the following questions are to be inquired into :—

1. Number of head of stock of each kind and age usually kept on the farm, and whether bred; and if bought, at what ages.

2. Number usually sold annually, and whether fat or store.

3. Use of purchased food.

4. System of winter and summer feeding.

5. Recent alterations in breed of stock or systems of management, if any, and the reasons for them.

6. System and cost of marketing fat and lean stock and wool.

7. Comparison of wholesale and retail prices.

8. Greater or less profit from breeding or feeding.

II. Under the heading "Condition of the farmers in each district," the following questions are set down :—

1. Tenure of owner and occupier.

2. Rent of tithes, including the manner in which the prices of corn for the purposes of tithe valuation are ascertained.

3. Imperial taxation, including the malt tax.

4. Local taxation.

5. Farm buildings.

6. House accommodation.

7. Cottages for labourers employed on the farm.

8. Recent profits or losses.

III. Under the heading "The labourer," the following are the questions agreed upon :—

1. His condition.

2. Principle and modes of living.

3. Wages in money and in kind.

4. Hours of labour.

5. House accommodation (cottages or otherwise), and rent, if any.

6. Allotments and gardens, and cottagers' grounds.

7. Cows and pigs, and poultry, if any kept.

8. Employment of women and children.

9. Effects of the Poor-law.

10. Benefit, friendly, and co-operative societies.

IV. The Land Laws (an inquiry suggested for the Commission itself):—

1. Settlements.

2. Powers of sale, transfer of land, and other powers of management and disposition possessed by limited owners.

3. Mortgages and other encumbrances.

4. Borrowing powers for permanent improvements and extent to which they have been used.

5. Landed Estates Court, Ireland.

6. Property of corporations and other chartered bodies and charities.

7. Church estates, glebes, and tithe commutation.

8. Crown lands.

9. Duchy lands.

10. Law of distraint and hypothec.

11. Game laws and the laws of trespass.

12. Powers of Enclosure Commissioners and Board of Works, Ireland.

13. Copyholds and powers of Copyhold Commissioner.

V. Land Tenancy (suggested for inquiry and report in the first instance by assistant Commissioners): –

1. Leases.

2. Agreements.

3. Land agency.

4. Land valuation.

5. Valuation of unexhausted manures and other improvements.

6. The working of the Agricultural Holdings Act.

7. Agricultural customs.

8. The Irish Land Act in its bearing on Nos. 1, 2, 5, and 7.

9. Church Lands in Ireland.

VI. Agricultural Education (to be investigated by the Commission itself):—

1. Agricultural colleges (higher education).

2. Agricultaral schools (intermediate education).

3. Private pupils on farms.

4. Instruction in agriculture in primary schools.

5. Technical instruction in agricultural operations, ncluding the making of dairy produce.

VII. Condition of Estates:—

1. Tenure of owner and occupier.

2. Extent.

3. Nature and size of farms, and length of present occupation.

4. Rents, whether recently reduced or otherwise.

5. Farms unlet, if any, and causes assigned.

6. Estate improvements, including buildings, drainage, &c.

7. Recent enclosures.

8. Unenclosed and hill land, and its adaptability for profitable cultivation as compared with the uses to which it is at present put.

9. Woods and forests, their extent and management.

VIII. Agricultural statistics, to be furnished by the Board of Trade.

IX. Returns of imports and exports of agricultural produce, to be furnished by the Customs.

X. Importation of agricultural produce from foreign countries:—

(*a*) America (investigations to be made in England):—

1. Wheat.

2. Maize.

3. Cattle, sheep, and pigs (alive).

4. Beef, mutton, and pork (fresh).

5. Hams, bacon, and other preserved or cured provisions.

6. Cheese, butter, and other dairy produce.

7. Eggs, honey, &c.

8. Fruit (fresh and preserved).

In each case to trace the cost of the article at the American port, the freight, the profits made by the several middle-men, and to account for the retail price to the consumer.

(*b*) France (investigations to be made in France and England):—

1. Wheat.

2. Barley, including special encouragement recently given to its cultivation by English brewers and French agricultural societies.

3. Butter (including the methods of making up into uniform quality large quantities for export.)

4. Eggs, including the methods of purchase, packing, and preserving.

5. Poultry.

6. Honey.

7. Fruits and vegetables, fresh and preserved.

8. Beetroot and sugar and beetroot spirit, in regard to which will be considered the cultivation of beetroot as a farm crop, how far, more or less, profitable than other farm crops holding the same place in rotation, utilization of pulp for feeding stock; nature of beetroot farms, whether proprietary, or otherwise; land tenure, including proprietary farming, tenant farming, métayer, leases, arrangements between incoming and outgoing tenants, &c.; laws relating to the ownership and inheritance of land; Government agricultural colleges, farms, schools, &c.; and Government rewards for agricultural improvements.

(*c*) Holland (investigations to be made in Holland and in England).

1. Grazing live-stock and exportation to England.

2. Dairying and exportation of butter, cheese, &c., to England, and manufacture of artificial butter.

3. Wheat production and market gardening.

4. Beetroot, sugar, &c. (same question as in France.)

5. Management of land below the sea level.

6. Systems of land tenure, especially the tenant rights of some districts.

7. Laws relating to the ownership and inheritance of land.

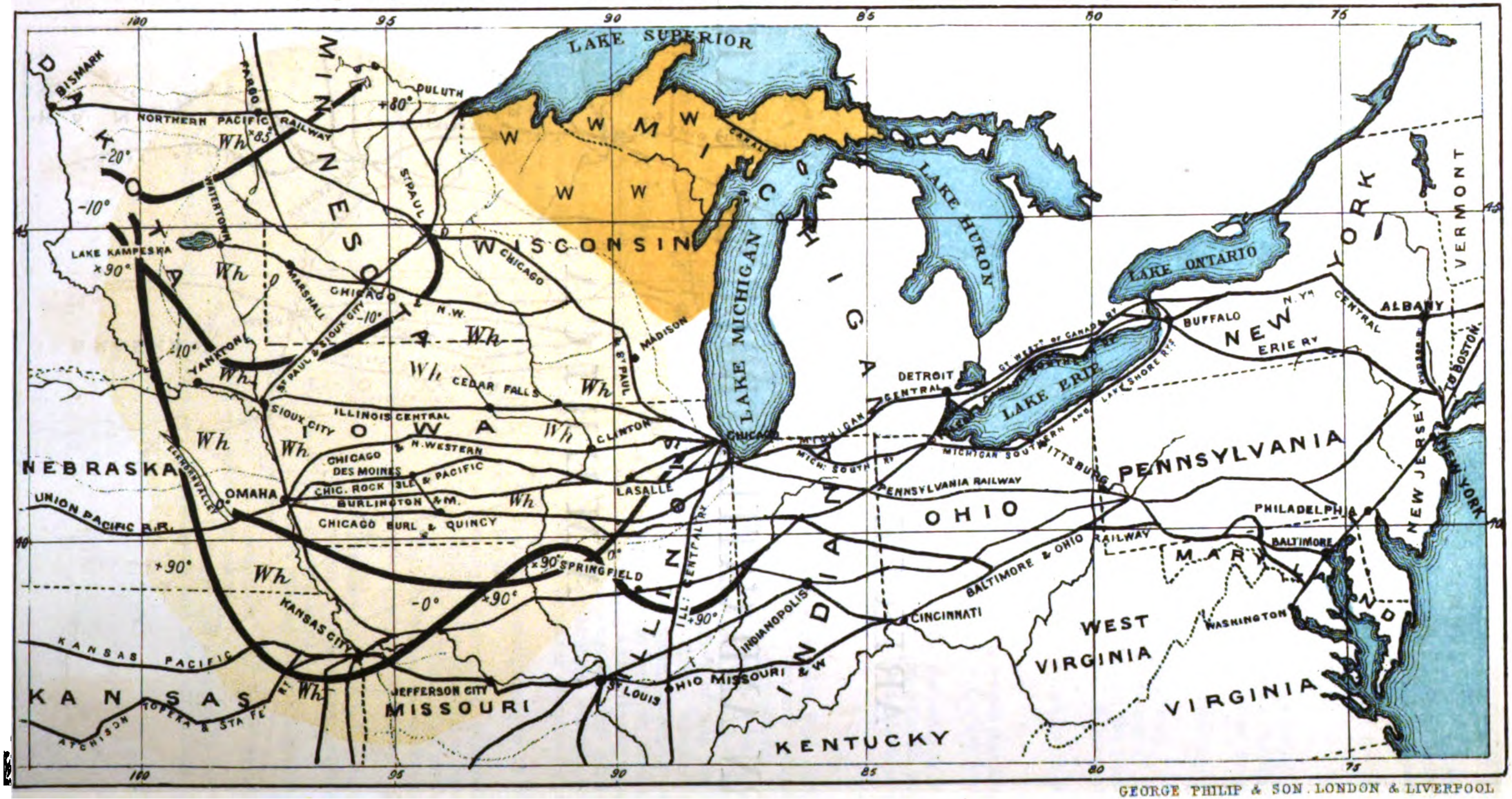
8. Government and other agricultural colleges, and farm schools.

9. Rewards and advances by the Government for reclamations, and other agricultural improvements.

MAPS
ARTICLES AND TABLES
ON THE
CORN AND CATTLE PRODUCING STATES
OF
AMERICA

MAP 2.

Compiled from the United States Statistical Atlas, and the Report of the Chief Signal Officer.

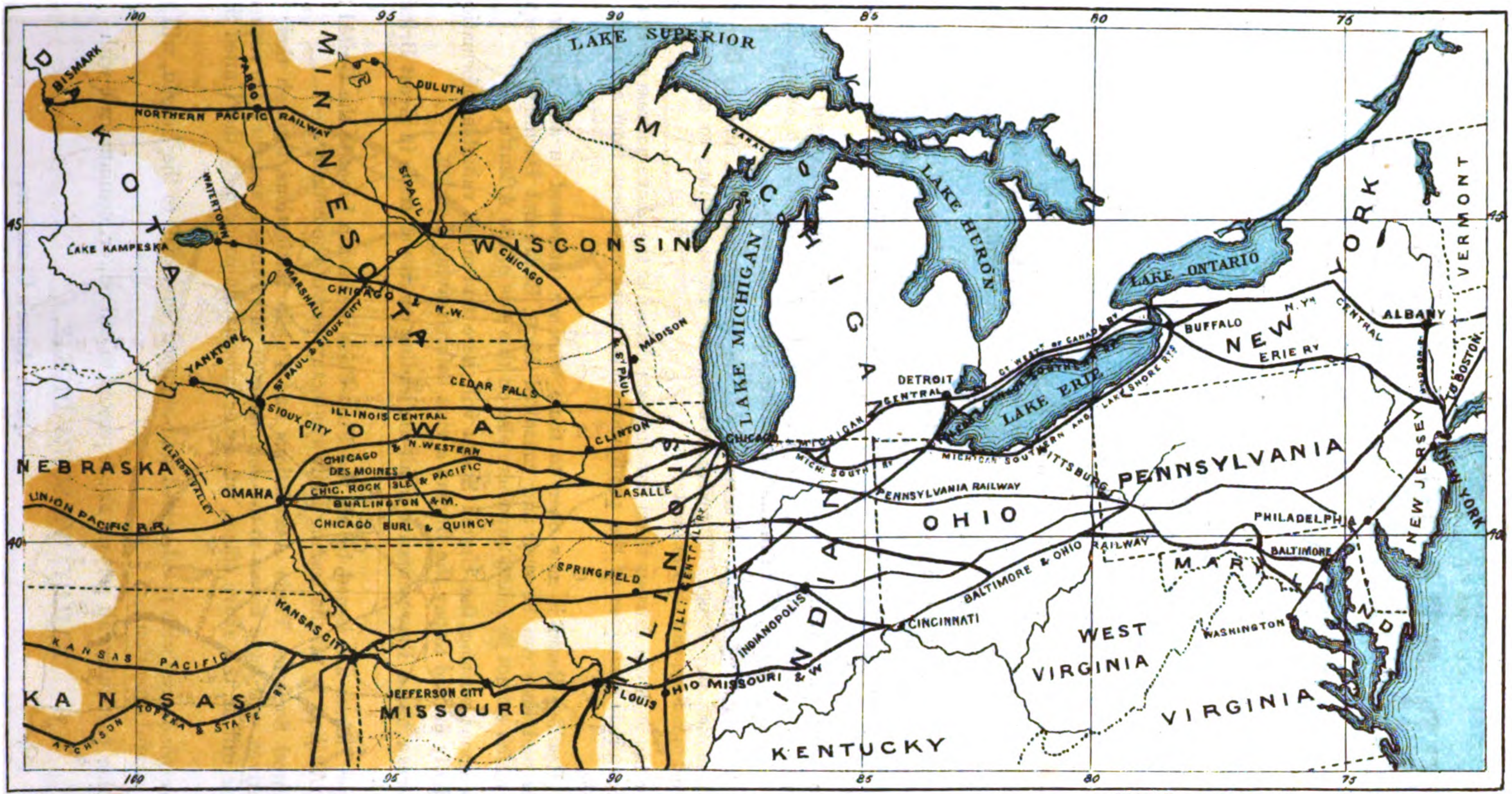


GEORGE PHILIP & SON. LONDON & LIVERPOOL

W..... Woodlands. ■
Wh.._Chief Wheat-growing Districts.
Indian Corn grows everywhere, but more plentifully towards the South.

The Figures thus —10° *represent lowest temperature in Winter.*
„ 90° „ *highest* „ *in Summer.*

MAP I.



Showing roughly the chief Railways from the Atlantic Ports to the Western Prairies.
The Coloured part denotes those Western Districts which are more or less settled.

The portions deeply shaded, especially about the Railways, indicate lands more available for New Settlers.
Although the leading Lines only are given, other Railways offer Lands.

THE

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QUEEN ANNE'S CHAMBERS,
62 HOLBORN VIADUCT,
LONDON, E.C.

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BAILEY, WILSON & DICKIE,
Queen Anne's Chambers,
62 Holborn Viaduct, London, E.C.

The Corn- and Cattle-producing States of America.

(BY OUR SPECIAL COMMISSIONER.)

[Preliminary and General Survey.]

BEFORE any statements are made, or any conclusions drawn, let the connection of both with facts be as clear to the reader as to the writer. The census years in America to which reference will be made are those of 1850, 1860, and 1870. It will be sometime yet before the census of 1880 is before the public, so later figures can be given only in reserve as estimates. Massachusetts, the foster mother of the American States, as a whole, will with New York represent the Eastern States. What did Massachusetts and New York do in the production of wheat and maize in those years? and what deductions may be drawn?

Massachusetts.

Bush. of	1850.	1860.	1870.	1877.
Spring wheat ..	—	—	17,594	18,300
Winter wheat ..	31,211	119,283	17,074	
Maize..........	2,245,490	2,157,063	1,397,807	1,250,000

As regards Massachusetts, the obvious deduction is that it is not holding its own against the wheat and maize production of the Western States. Yet it enjoys what may as well be called protection. Chicago, roughly stated, is 1,200 miles distant, and Dacota, and the British Province of Manitoba, are, roughly stated, 2,000 miles distant. It is a long and tedious navigation from Manitoba, Dacota, and Chicago to the Atlantic seaboard, and at the mere cost of transit by railway, the charge is a large deduction from the New York selling price. Massachusetts gets its wheat and maize to market on the Atlantic seaboard at a nominal cost, and yet finds farming one of the least profitable occupations for its people; whereas the distant American States and the remote British Provinces are severely taxed for transportation, and yet find agriculture the most profitable of all occupations for their people. The position of the Massachusetts or New England farmer in relation to Western farming is somewhat analogous to the position of English farming in relation to farming in the south of Europe, India, and Australia. The English farmer has the home market at his door, whereas the Australian, Indian, and South of Europe farmers have long ocean distances against them. No one will say that the Australian, the Indian, and the South of Europe farmers are doing to the English farmer what the Western American farmer is doing to the Eastern American farmer, for the English farmer has always been able to hold his own against these competitors; but as we proceed in this inquiry it will become too painfully evident that the English farmer cannot compete with the Western American farmer, even so well as the Massachusetts farmer. This is not the place for the discussion. Here the province is to keep within the bounds of fact, and of obvious inference from fact. The fact then is that since 1850 New England farming has been stagnant, if not retrograde, in the face of Western farming competition. The least remunerative farming has consequently to yield to the more remunerative farming. Turn next to New York—the State of New York—not the city.

New York.

Bush. of	1850.	1860.	1870.	1877.
Spring wheat ..	—	—	1,834,330	12,800,000
Winter wheat ..	13,121,498	8,681,105	10,344,132	
Maize..........	17,858,400	20,061,049	16,462,825	22,700,000

New York State will be found to possess many striking points of resemblance to our own country. It is an old settled State, with farms like English farms, and houses, streets, and towns like their counterparts in England. Generations of the same families have farmed the same lands in New York State, and although the lands are free from entail, restrictions as to cropping, and even as to presumptions in law, the fight for life against the new lands of the Western States and Canada is, as the figures show, a hopeless one. There is no increase in New York farming. The young men of New York do not seek to add to the family acres. They go away, and leave the old people at home to do as their fathers did before them. The young New Yorkers, like the young New Englanders, accept the grim logic of ascertained fact, pack up, and settle down upon the broad expanse of Western prairie. If this is the fate of New York, what in England is in store for the English tenant farmer and for the English landlord? Here that discussion will not be raised. It will come up by and by with all the facts necessary for a sound judgment being formed. Pass next to Ohio and Illinois; the first as representative of the Middle States, the second as representative of the elder Western States.

Ohio.

Bush. of	1850.	1860.	1870.	1877.
Spring wheat ..	—	—	256,400	26,000,000
Winter wheat ..	14,487,351	15,119,047	27,625,359	
Maize..........	59,078,695	73,543,190	67,501,144	97,000,000

If this is not stagnation, it is progress in a limited sense only. But it will be said, there was the interruption of the war. There was. In the same way, when the far Western States are spoken of, there will be the locusts one year and the grasshoppers another year. This inquiry excludes grasshoppers, locusts, and war. It is an inquiry dealing only with returns: with increase or diminution in the various States, and with the bearings on ourselves. Judged by the figures, Ohio, like New York, is having the old folks at home, while its youth and manhood are taking up claims beyond the Mississippi, and publishing to the world their extraordinary successes. In future numbers of THE FARMER these statements of youth and manhood will appear. The fine old State of Ohio will be spoken of with its solution of the problem, whether an honest man, with a working wife and such family help as remains with them, can live comfortably and respectably, and make money on forty-acre holdings which are their own freehold. Here only on that subject it can be said that a forty-acre freehold farm in Ohio seems all that a wise man should seek. It yields to him and his an honourable competency, and what more can any man desire. Ohio, in a word, teaches this lesson: that it has found out what it can do at home, and what it should do away from home. It has given up the desperate game of trying to make Ohio farming pay better than Western farming. Western farming by the side of Ohio farming is confessed to be common sense by the side of folly; wealth in armfuls in the one case with very little effort, and wealth enough to make both ends meet in the other case, as the return from ceaseless industry and self denial. What next says Illinois?

Illinois.

Bush. of	1850.	1860.	1870.	1877.
Spring wheat..	—	—	10,133,207	33,000,000
Winter wheat..	9,414,575	15,119,047	19,995,198	
Maize	57,646,984	73,543,190	129,921,395	260,000,000

Illinois stands at the portal of the future of American farming; and with what results? There is no mistaking them. Here farming becomes an occupation worthy of a man of enterprise, resource, and skill. The soil is fruitful, and the soil is free. So fruitful is Illinois, that it has been said of one district, that on the bottom lands of the Illinois river, as on the Kentish marshes of the river Thames, crops have been grown for upwards of two hundred years without manuring. Not quite so much can be said of the Kentish marshes, for when market-garden stuff is grown, manure is furnished with a liberal hand, while a wheat crop following gets no manure. The Illinois bottom lands were first planted with maize by the French missionaries from Canada, and not only is maize still grown, but the maize is said to be the best that is offered on the Chicago market. So far, it appears clear that in America farming is in a transition state: it is gravitating steadily towards those boundless regions where it can be pursued under the easiest and most remunerative conditions. In 1850 farming was a hopeful calling in the New England States, and in Canada; in 1860 it was more profitable in Ohio and in Illinois, and New Englanders and Canadians moved freely there; in 1870 all farming east of Illinois became clouded; and in 1879 Manitoba, in the far west of Canada, calls to the Canadian, and Dakota, Nebraska, and Kansas to the American. In view of these changes the position of the English tenant farmer at each of those periods is, as before remarked, a deferred question. This at least may be said, that American grain being grown for the English as well as for the American market, the changes in the conditions of American farming, are scarcely less potent here than in America. If prosperity is again to attend English tenant farming there must be other changes besides those of weather. The English tenant farmer, if the conditions of far West farming are denied to him, may surely claim an approach to equality with the stagnant farming of New England, and with the semi-prosperous farming of Ohio and New York. The prefatory remarks on farming may be fitly closed by enumerating the chief wheat and maize growing States as shown by the 1870 yield. These States will show the ever-changing belts or zones.

Alabama.

Bushels of	1870.	1877.
Spring wheat	—	1,400,000
Winter wheat	—	
Maize	16,977,948	23,000,000

Arkansas.

Spring wheat	—	1,610,000
Winter wheat..........	—	
Maize	13,382,145	22,100,000

California.

Spring wheat	16,676,702	22,000,000
Winter wheat	—	
Maize	1,221,222	1,550,000

Connecticut.

Spring wheat	—	36,500
Winter wheat..........	—	
Maize	1,570,364	1,950,100

Delaware.

Spring wheat	—	980,000
Winter wheat..........	—	
Maize	3,010,390	3,950,000

Florida.

Spring wheat	—	—
Winter wheat..........	—	—
Maize	2,225,056	3,050,000

Georgia.

Spring wheat	308,890	3,800,000
Winter wheat..........	76,885	
Maize	17,646,459	22,400,000

Illinois.

Spring wheat	10,133,207	33,000,000
Winter wheat..........	19,995,198	
Maize	129,921,395	260,000,000

Indiana.

Spring wheat	161,991	24,600,000
Winter wheat..........	27,585,231	
Maize	51,094,538	96,600,000

Iowa.

Spring wheat	28,708,312	37,810,000
Winter wheat	727,380	
Maize	68,935,065	156,000,000

Kansas.

Spring wheat	1,314,522	14,400,000
Winter wheat	1,076,676	
Maize	17,025,525	98,800,000

Kentucky.

Spring wheat	38,532	7,150,000
Winter wheat..........	5,690,172	
Maize	59,091,006	59,500,000

Louisiana.

Spring wheat	—	—
Winter wheat..........	—	—
Maize	7,596,628	12,750,000

Maine.

Spring wheat	—	350,600
Winter wheat..........	—	
Maize	1,089,888	1,680,000

Maryland.

Spring wheat	1,095	6,780,000
Winter wheat..........	5,773,408	
Maize	11,701,817	13,360,000

Massachusetts.

Spring wheat	—	18,380
Winter wheat..........	—	
Maize	1,397,807	1,250,000

Michigan.

Spring wheat	18,798,188	21,890,000
Winter wheat..........	76,885	
Maize	14,086,238	20,750,000

Minnesota.

Bushels of	1870.	1877.
Spring wheat	18,798,188	33.324,346
Winter wheat	76,885	
Maize	4,743,117	13,200,000

Mississippi.

Spring wheat	—	450,000
Winter wheat	—	
Maize	15,637,316	20,800,000

Missouri.

Spring wheat	1,093,905	20,000,000
Winter wheat	13,222,021	
Maize	66,634.075	103,000,000

Nebraska.

Spring wheat	2,109,321	5,640,000
Winter wheat	15,765	
Maize	4,736,710	38,500,000

New Hampshire.

Spring wheat	—	220,000
Winter wheat	—	
Maize	1,277,768	2,400,000

New Jersey.

Spring wheat	2,099	2,200,000
Winter wheat	2,299,334	
Maize	8,745,384	9,800,000

New York.

Spring wheat	1,834,330	12,800,000
Winter wheat	10,344,132	
Maize	16,462,825	22,700,000

North Carolina.

Spring wheat	405,238	3,900,000
Winter wheat	2,454,641	
Maize	18,454,215	22,800,000

Ohio.

Spring wheat	256,400	26.000,000
Winter wheat	27,625,759	
Maize	67,501,144	97,000,000

Oregon.

Spring wheat	1,794,494	6,875,000
Winter wheat	546,252	
Maize	—	128,000

Pennsylvania.

Spring wheat	322,328	18,200,000
Winter wheat	19,350,639	
Maize	34,702,006	41,120,000

Tennessee.

Spring wheat	375,400	11,400,000
Winter wheat	5,813,516	
Maize	41,343,614	50,500,000

Texas.

Spring wheat	—	4,800,000
Winter wheat	—	
Maize	20,554,538	49,000,000

Vermont.

Spring wheat	—	550,000
Winter wheat	—	
Maize	1,6,9,882	2,150,000

Virginia.

Spring wheat	7,389	9.450,000
Winter wheat	7,391,398	
Maize	17,649,304	19,400,000

West Virginia.

Spring wheat	3,395	3,850,000
Winter wheat	2,480,148	
Maize	8,197,865	9,600,000

Wisconsin.

Spring wheat	24,375,435	22,000,000
Winter wheat	1,230,909	
Maize	15,032,998	28,704,000

All States and Territories, as Utah, Oregon, Colorado, Dakota, &c., producing less than a million bushels of maize, are excluded from the list. The list shows that maize is grown in the coldest State—Vermont, and in the hottest State—Texas. It is an American saying, that a man is a long way from home where maize does not grow.

Since 1870, the last census year, extraordinary progress has been made—first, in the better adaptation of railways to the wants of new districts, and secondly, in the settlement of new districts.

Previous to 1870 the trans-Mississippian region was practically regarded as beyond the reach of successful railway enterprise, and so long as this opinion gained currency, immigrants from Europe had to scatter themselves over the older States with comparatively small percentage additions to the annual production of wheat and maize. The construction of the Pacific railway first modified this opinion and then extinguished it. It was found that an active gang of men could lay down a mile of permanent way on the prairie daily, and that a dozen gangs of men might be concurrently employed. This was a dozen miles of railway daily; at so much for iron, so much for ties or sleepers, and so much for wages. Local capitalists had only to obtain charters for railways conveying as many miles of land on each side as the State or the Territorial Legislatures were willing to give away to help the construction of the railway. Eastern ironmasters and bankers then became interested in the projects, and in the longrun the railway became less an investment than a means to make waste lands valuable and to increase the supply of grain. In perhaps the majority of cases Western railways throughout the past two years have carried grain at an actual loss, in the hope, no doubt, that when trade revived they would be able to obtain paying rates, but at the moment when every American interest is in a prosperous condition, no embargo of higher transportation rates is dreamed of. On the contrary, our old English friend, the Grand Trunk Railway of Canada, has caught the spirit of the times, and is about to open an extension to Chicago. In the far west a movement is on foot to put pressure on Congress at its forthcoming session to modify the import duty on railway iron, that the work of extension across the prairies may be taken up in the spring with redoubled zeal. Thus the next ten years promises to be fruitful in new lands made accessible to market. What that accessible area is, will presently be shown.

Quoting from a recent article in *Macmillan's Magazine*, the ten Central Western States of Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, and the eastern or fertile portions of Kansas and Nebraska, contain about 380,000,000 acres of land, similar in character of soil, and for the most part in climate and productions. Making ample allowance for lands under cultivation, for lands only suited for grazing, and for lands at present not worth cultivation, these Central Western States present an aggregate acreage now ready to be entered on of 130,000,000 acres. Beyond these States there is an even greater ultimately available area, making a total of 283,000,000 acres. This estimate, it should be stated, excludes our own territory of the Red River and beyond, so that the American total of available land—altogether available during the next ten years—will not fall short of 400,000,000 acres.

So much space has been given to the foregoing returns, that the preliminary remarks on cattle must be curtailed.

Texas is the chief cattle State, and its progress has been as follows :—

Texas.

Neat Cattle	1850	1860	1870
On Farms	330,114	3,535,768	3,494,043
Off Farms	—	861,646	496,115

There is a decrease by the last enumeration ; but the increase from 1850 to 1860 is extraordinary, if not alarming, to the English tenant farmer. When the State of Texas comes to be spoken of later on, it will appear that the falling off in 1870 was chiefly owing to the want of market for the cattle. Now, with preparing beef in tins and shipping live cattle to England, the later enumerations will show again an enormous gain. The cattle feed upon the prairie, as at the River Plate, and claim no more attention. At the River Plate a boy of eight or ten years of age may be trusted to climb the fore leg of a horse to reach the back, and then to gallop off to turn a herd of cattle. There also, as in Texas, the value of a bullock is the price that the skin will sell for, and the price of the tallow that the bullock will boil down to. With such facts as these before us, the sooner the prospective condition of the English tenant farmer is discussed, the better. Sooner or later the discussion must be engaged in, as there can be no running from it.

In 1870 New York was the second cattle-producing State.

New York.

Neat Cattle	1850	1860	1870
On Farms	1,877,639	1,973,174	2,045,324
Off Farms	—	31,801	40,906

This is a rate of increase that approximates closely to increase in England, and bears out the preceding remarks on the settled, old-fashioned condition of New York farming. Only six other States in 1870 presented totals of neat cattle in excess of a million :—Illinois, 1,715,586 on farms and 228,987 off farms ; Indiana, 1,026,184 on farms and 156,804 off farms ; Iowa, 1,006,235 on farms and 130,810 off farms ; Missouri, 1,153,695 on farms and 115,370 off farms ; Ohio, 1,436,217 on farms and 85,204 off farms ; and Pennsylvania, 1,344,551 on farms and 161,346 off farms. It should be added that the cattle States now recognised as within the cattle belt with Texas, namely, Kansas, Nebraska, and Dakota, had no cattle in 1850. In 1860 the three States first appear in the returns with :—

Kansas.

Neat Cattle	1850	1860	1870
On Farms	—	93,455	373,967
Off Farms	—	34,938	624,380

Nebraska.

On Farms	—	37,197	2,484
Off Farms	—	79,928	312,788

Dakota.

On Farms	—	801	—
Off Farms	—	12,467	44,257

These preliminary remarks need not be prolonged. They make out a strong case for a full development of the subject. This will be done, in future numbers of THE FARMER, from a large mass of collected information, which will be dealt with, not to exaggerate the magnitude and importance of the corn and cattle trade of America, nor to depreciate it. Facts only will be put forward, and the separate States will be taken in the order of the readiness and completeness of the information respecting them. Incidentally most useful information will be given on the cognate subject of emigration, but there will be no special recommendation of any part. The intending emigrant must read and choose for himself. He will do well to bear in mind that each American State has upon its statute book, if not within the four corners of its printed constitution, a list of exemptions from attachment or seizure for debt. Other things being equal, the intending emigrant should go where the exemptions are greatest. The American social problem excludes pauperism, so far as that is possible by legislation.

POSTSCRIPT.

The quotation from the article in *Macmillan's Magazine* gives a total available acreage, in the best part of the United States, of 400,000,000 acres. To fairly estimate the quantity of land available in the best parts of North America, our own Canadian province must be included, and within the past week or two the Canadians have resolved on proceeding with their Pacific railways, the contracts having been given out. This will immediately bring into the market an enormous breadth of the best wheat-producing lands. Assume that the Canadian Pacific Railway receives like land grants to the United States Pacific Railway, and Canada becomes possessed of no less than 159,486,766 acres of new land. Assuming further, that this will be a grant of alternate section only, then an equal quantity becomes available as the property of the Canadian Government, as distinguished from the quantity of the property of the Canadian Pacific Railway. Add to these already enormous aggregates the available lands on the books of the Canadian Land Office, as recently set forth in an official pamphlet. Those additional lands are set forth as estimated at 375,000,000 acres, 10,500,000 acres of this quantity being surveyed wheat land in Manitoba, ready to be given away for nothing to *bonâ fide* settlers. These Manitoba wheat lands are said to present a better average yield of a heavier wheat than the neighbouring States. The official comparison is as follows :—

Manitoba	20	bushels	per acre of	63	to 66 lbs.
Minnesota.........	17	,,	,,	60	,, 65 ,,
Wisconsin.........	14	,,	,,	52	,, 58 ,,
Pennsylvania ...	15	,,	,,	57	,, 60 ,,
Massachusetts ...	16	,,	,,	57	,, 60 ,,

The land already taken up in Manitoba down to last year (1878) was no less than 2,076,428 acres ; and no doubt within the next ten years the remainder of the ten and a half million acres will be well under plough and harrow. Say, however, that only 5,000,000 acres are then under crop, and at 20 bushels an acre, from that comparatively small district alone, there will be added to the wheat production of the world no less in annual quantity than 100,000,000 bushels. Then at no distant period with the 400,000,000 acres of the best United States lands entered on, and the 375,000,000 acres of the best Canadian lands entered on, to say nothing of the Canadian Pacific lands, what really is the prospect before the English tenant farmer ? If 5,000,000 acres give a return of 100,000,000 bushels, 775,000,000 acres would give a return of a completed submerging quantity. An appropriate space will be given in THE FARMER to the corn and cattle producing capabilities of Canada, and to the claims of the province on the attention of the intending emigrant.

American Notes.

COST OF WHEAT-GROWING IN AMERICA.

Sir,—A letter in the *Times* Weekly Edition of the 24th ult., from Mr Savory, asks for information as to the cost of producing wheat in the United States. I have have much pleasure in giving you the cost per acre in the spring-wheat States—Iowa, Nebraska, Dakota, Minnesota, and Wisconsin:—Ploughing, 1 dol. 50 cents; dragging and sowing, 1 dol.; seed, 1 dol. 50 cents; harvesting, 2 dols. 50 cents—6 dols. 50 cents; equal to £1 6s. 9d., to which must be added 10 cents, or 5d. sterling, per bush. for thrashing, &c. For new land add 2 dols., or 8s. 4d. sterling, for breaking. Minnesota certainly raises more wheat to the acre than any other State in the Union, her average for the last ten years being nearly 16 bushels per acre. Taking the United States as a whole, I find the average for the last five years ending 1877 to be very slightly under 11 bushels per acre. The spring-wheat States named above have on an average for five years produced a fraction over 13 bushels per acre. The greatest known yearly average of Ohio, the largest producer of the winter-wheat States, is 17½ bushels; while the average for ten years, as officially shown, is 10.55 bushels per acre. Illinois produces year by year not more than 10 bushels per acre; Iowa, 14 bushels; California, 13; Kansas, 13; Wisconsin, 14. You will see from this the superiority of British agriculture; the average in the United Kingdom in favourable seasons being 30 bushels per acre. I may add, the cost of moving grain from the interior to the seaboard during open navigation will average for the last three years under 9d. sterling per bushel.—Geo. Osborne.

Kingston, Canada, February 10.

THE COST OF PRODUCING CORN IN AMERICA.

To the Editor of the South Eastern Gazette.

Sir,—I inclose you an extract from a letter from a gentleman in Montreal, in official position connected with the Hudson Bay Company, and on whose accuracy I have been informed dependence may safely be placed. The letter was given to me in London a few days since, and I thought that the statement relating to the cost of production of corn, &c., in the North-Western States of North America, and the cost of transport to Liverpool, might be interesting. I therefore send it to you for publication, if you will be kind enough to give it insertion in your paper.

I am, Sir, yours faithfully,
Thomas Hankey.

September 17, 1879.

Take a point 250 miles west of Winnipeg (which will be 150 miles beyond the western limits of Manitoba), and the cost of carrying grain from any station within that distance will be as follows:—

	Per bush. Cents.
Railway transport from 250 miles of Winnipeg to Thunder Bay	15
Propelled, *viâ* Welland Canal, from Thunder Bay to Montreal, including handling at Kingston	10
Freight from Montreal to Liverpool, including elevating charges at 5s. a quarter	15
Total	40

The rates this year from Montreal to Liverpool have been as low as 2s. 9d. a quarter, and I feel sure that 5s. is above what the average will be. But taking 40 cents. a bushel, that is equal to 13s. 4d. a quarter for the cost of transport from a point 250 miles west of Winnipeg to Liverpool. From the best information I could get, grain can be grown in Manitoba, including all outlays, interest on land bought, labour, ploughing, sowing, harvesting, and carriage to the nearest railway station in the grower's own waggon, for 45 cents a bushel. Many people put it as low as 30 cents, and the most cautious estimate I have heard has never exceeded 50 cents. I think I am quite safe in saying that in an average of years the cost will not exceed 45 cents; that is equal to 15s. a quarter. The result will then be as follows.—

	Per Qr. s.	d.
Cost on board railway cars at a point up to 250 miles west of Winnipeg	15	0
Transportation from said port to Liverpool	13	4
Total	28	4

I am satisfied that it is a safe and liberal estimate, and that in practice, three years hence thereafter, wheat grown in our North-West will be laid down in Liverpool at from 26s. to 28s. a quarter. I see that in the last thirty years the price of wheat in England has been as follows:—

	Per qr. s.	d.
Average of 10 years, from 1849 to 1858	53	3
,, ,, 1859 to 1866	51	5
,, ,, 1869 to 1878	51	2
Average of the last 30 years	51	11

EXPENSES OF WHEAT PRODUCTION IN AMERICA.

The crop is much larger this year than it was last, and though the weather was unusually bad and changeable for America, the harvest was well got. As there are now railroads working, others making, and again more contemplated, I believe the surplus of wheat produced beyond the quantity wanted for home consumption in Canada and America will increase every year for some time to come. Also, as they get money from selling their wheat they will invest some of it in manures, and instead of having 11 bush. per acre to sell, grown on their now unmanured land, they will very much raise the productive powers of their land. Besides this, the wheat zone is enormous, and as the flood of emigration has again set in westward more acres will be cleared and cultivated. As to the expense, I think that the gentlemen quoted in your paper are in error, for I have no doubt that, though from the very farthest part of the wheat-producing districts it may be more, yet wheat can be landed at Liverpool from the average of the distance from the coast at a cost of 4s. per bush., or 32s. per qr. Can you compete with this in England? I say certainly not.

"I put the expenses thus:—

One Acre.	Dol.	Cent.		£	s.	d.
Ploughing	1	50	...	0	6	3
Dragging and sowing	1	0	...	0	4	2
Seed	1	50	...	0	6	3
Harvesting	2	50	...	0	10	5
Threshing	0	52	...	0	2	2
Interest on Freehold	0	48	...	0	2	0
	7	50		£1	11	3
Moving to seaboard	0	33	...	0	1	4½
Freight and landing	1	98	...	0	8	3
Insurance and commission on sale	0	50	...	0	2	1
	10	31		£2	2	11½

The above is the cost of producing 11 bush.

"If the cost came to £2 4s. for 11 bush., that would be exactly 4s. per bushel, and allowing 1s. 0½d. more than I have calculated, I will put it at that sum. I make this calculation taking the bushel to average 56 lbs. weight, which brings 5 qrs. to weigh 1 ton. You have had great experience, and have grown crops that sound almost fabulous in quantity (p. 28), but I see that, with all that science and capital could do, for three years you had crops far less to the acre than for the seven previous years. The fact is, that in America the sun never fails them as it does in this climate. Their crops ripen quickly, and it is almost a certainty that they have fine weather for harvesting. Bad weather beats even energy and good judgment. Mr Osborne, I think, greatly overrates the average wheat produced per acre in the United Kingdom, even in favourable seasons, when he puts it at 30 bush. I believe 20 bush. to be much nearer the mark. He is wrong also in saying that it costs 9d. per bushel railway freight to the coast, which would be £1 10s. per ton. I believe it to be an error also to say that the railways are carrying wheat at a loss. There is not sufficient competition to cause them to do that.

"The result of my consideration of the subject is is this: that climate, steam transport by sea and land, together with the labour question on both sides of the ocean, have made it out of the power of our agriculturists to compete with the growers of wheat on the American continent, and that they must turn their attention to cheaper and better modes of growing beef and mutton, so as not to be driven out of that market also by the Americans. The distance, difficulty and expense of transport of live and dead meat, give us an advantage we shall be wise to improve, instead of wasting time and capital in trying the impossible task of competing with them in growing wheat.—*Duke of Beaufort.*

POPULATION OF THE UNITED STATES.

The general rate of increase has been remarkably steady since the commencement of the century, shown by the following table:—

1790	3,929,827
1800	5,305,925
1810	7,239,914
1820	9,638,131
1830	12,866,020
1840	17,069,453
1850	23,191,876
1860	31,443,221
1870	38,558,371
1880 (estimated)	50,858,000

Between 1790 and 1860 the rate of increase was from 32 to 36 per cent., but between 1860 and 1870—the years of the war—it fell to 22½ per cent. Two points are very remarkable throughout the States—first, the extraordinarily rapid increase of the large cities; second, the persistent migration of population westward.

New York, the population of which in 1860 was 813,669, reached the figure of 942,292 in 1870, and is now over a million.

Boston, *Baltimore*, and *Philadelphia*, at the time of the revolution of 1776, contained from 20,000 to 30,000 inhabitants, whereas at the last census they had respectively 250,000, 267,000, and 674,000.

Chicago, at the beginning of this century a small village, is now a city of 300,000.

St. Louis, which in 1834 was only an Indian trapping station, now contains 310,000 inhabitants.

The other cities possessing over 100,000 are Cincinnati, 216,000; New Orleans, 191,000; San Francisco, 149,000; Buffalo, 117,714; Washington, 109,000; Newark, 105,059; Louisville, 100,753.

The gravitation westward of the population has been most marked. In 1800 the centre of population was in the longitude of Washington; in 1840, of Pittsburg; in 1870, of Cincinnati; and next year it will probably be found at Indianopolis. In connection with this migratory feature, the population statistics at the last census of the western Territories are of interest—viz. Arizona, 9,658; Colorado, 39,864; Columbia, 131,700; Dakota, 14,181; Idaho, 14,999; Montana, 20,595; New Mexico, 91,874; Utah, 86,786; Washington, 23,955; Wyoming, 9,118.

AMERICAN FOOD SUPPLIES.

Mr Finlay Dun thus writes:—With the American agriculturist, and political economist, it is not how much can be grown, but, rather, what increasing supplies can be satisfactorily disposed of at home and abroad. With a reasonable prospect of extra supplies being absorbed, there is no doubt that an annual addition of ten per cent. might continue to be made to the food production of the United States. The wheat yield has certainly gone on increasing in a marvellous manner, as may be gathered from the subjoined figures, setting forth the produce of various years :—

1850	100,485,994 bushels.
1860	173,104,124 ,,
1870	235,884,700 ,,
1876	289,356,500 ,,
1877	364,194,146 ,,
1878	420,122,400 ,,
1879	448,000,000 ,,

The area under wheat in 1878 was double that of 1876. It is ten times that of the British Islands. In Indian corn and other grain, in potatoes, dairy produce, and meat, the ratio of increase has been almost as great as in wheat. There has been not only abundance to feed a rapidly increasing home population, but a bigger surplus to spare for exportation. For eight years previous to 1872 the yield of wheat per head of the United States population was about 5 bushels annually. The enormous crops of 1878 and 1879 indicate a yield which would give 8¼ bushels per head to the population, and hence have largely augmented amounts for exportation. Thirty-five per cent. of the wheat grown in the States is now exported. The exports to June 30, 1879, reach nearly 150 million bushels, and of this enormous amount nearly one-half is taken by Great Britain.

Large as is the cultivated area under grain crops, it does not occupy one half the available extent of the continent. Of such well-known and fairly-populated States as Minnesota, Iowa, and Kansas, much more than one half still lie uncultivated. Nebraska, Dakota, Oregon, and Colorado in the aggregate, have still half their area unsurveyed, and enormous tracts of useful prairie and plain lying barren. Great though the increase of American herds and flocks have been of late years, there are hundreds of ranches where the sparsely spread beasts still enjoy their square mile of pasture.

But what of the American meat supplies? Any-one who visits the ranches in the Far West, who sees the bullocks feeding in winter in Iowa and Illinois on corn grown at 12 to 15 cents a bushel, who watches the sales in the stock yards at Council Bluff, Chicago, or Jersey City, and calculates the cost of production and of transport, will arrive at the conclusion that prime American meat can be landed at British ports and sold with a satisfactory profit at 6d. per lb. If American exporters could guarantee this moderate figure, risks, insurances, and commissions could all be readily met; modern appliances would be more extensively adopted; improved refrigerators, such as that now in course of erection at Cardiff, would be multiplied; a great impetus would be given to the trade both in dead and live stock, and the supplies might steadily be multiplied tenfold or more. But the risks and uncertainty of the American meat business limit considerably its development. Every now and then a big Atlantic wave consigns to a watery grave a few hundred pigs or sheep; and even cattle are washed overboard, or injured, or killed in stormy weather. A disabled screw prolongs an ocean voyage for several days, the ice supply runs short, and a large cargo of meat is spoilt. Insurance rates accordingly are high. Risks for those who do not insure are hence heavy. But equally annoying, and equally impossible to foresee or avert, are the glutted markets which recur, and which during the past few weeks have pulled down the price of prime American meat weighing upwards of 800 lbs. to the carcass from 6d. to 4½d., and even to 4d. per lb. Such sacrifices have sorely tried many American importers, and the recent low range of prices has wound up at least one concern. This sensitiveness of the British meat markets, their liability to a sudden collapse under large supplies, the impossibility of a surplus of meat, or, under present arrangements, even of live cattle being held over very many hours, naturally makes American speculators cautious, and gives a very valuable advantage to British stock owners who study the markets and are close to the consumers.

THE MAIZE CROP IN THE UNITED STATES.

From the Chicago *Daily Commercial Bulletin* of September 12 we make this extract :—

The following table exhibits the estimated acreage and yield of maize for the year 1879 in the States named, compared with the returns of the Agricultural Department at Washington, and the reports of State officials for the year 1878 :—

	1879.		1878.	
States.	Acres.	Bush.	Acres.	Bush.
Illinois	8,965,000	313,775,000	8,672,000	250,560,000
Iowa	6,000,000	210,000,000	5,686,000	175,256,000
Kansas	2,[illegible]95,000	104,815,000	2,406,000	81,563,000
Nebraska	1,600,000	56,000,000	1,291,000	54,222,000
Missouri	3,750,000	131,250,000	3,552,000	93,062,000
Minnesota	390,000	13,650,000	328,000	11,000,000
Wisconsin	1,000,000	35,000,000	984,000	36,900,000
Total	24,700,000	864,490,000	22,919,000	702,563,000

The estimated yield for the year 1879 is based on an average of 35 bushels.

If to the above seven States be added the yield of the other thirty States (taking the total as the same as last year), the grand total will be approximately :—

	Qrs.
Seven chief States	108,000,000
Thirty other States	106,000,000
Total	214,000,000

By appointment to the First Commissioner of H. M. Works and Public Buildings.

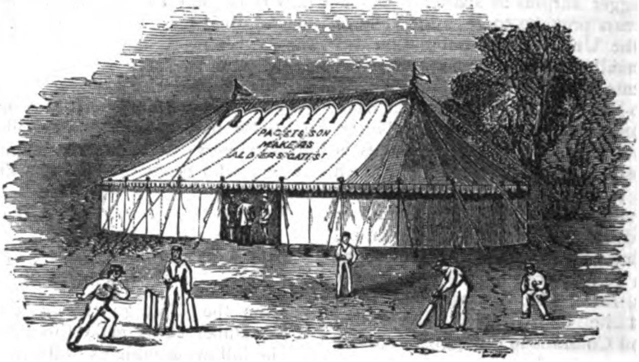
PAGET & SON,

MARQUEE, TENT, FLAG, RICK CLOTH, SACK, ROPE,

AND

TARPAULIN MANUFACTURERS,

NETTING,
NETS, TWINES,
SASH LINES,
WATERPROF
OMNIBUS AND
CARRIAGE
APRONS,



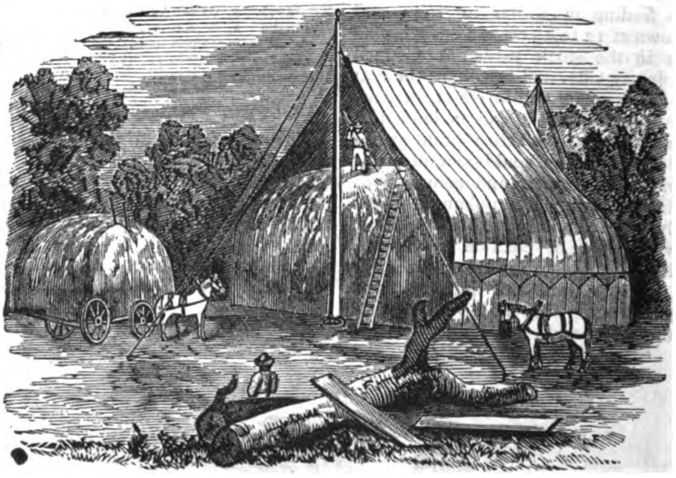
HORSE
CLOTHING,
LOIN CLOTHS,
NOSE BAGS,
RAILWAY
RUGS,
INDIARUBBER
COATS,

46 ALDERSGATE ST., LONDON;

AND

BASINGSTOKE, HANTS.

MILL BANDS,
PACKINGS,
RAILWAY
ENGINE,
CART, AND
WAGGON
SHEETS,
CANVAS,



COTTON
WASTE,
SPUN YARN,
FILLIS,
GASKET,
SCAFFOLD
CORDS,
BELL ROPES.

PRICE LIST AND ESTIMATES FOR DECORATIONS.

MARQUEES, TENTS, FLAGS, ON HIRE FOR AGRICULTURAL or FLOWER SHOWS, &c.

The Corn-Producing Districts of Russia.

Translated from *L'Echo Agricole* and reprinted from *The Miller*.

IN the grand international market of Europe, Russia figures as the country *par excellence* for the production of cereals. According to the statistical accounts of late years Russia produces on an average 1,888,425,000 imperial bushels of grain annually, 1,740,750 imperial bushels of which are produced by European Russia (comprising the kingdom of Poland, the produce of which amounts to 87,150,000 imperial bushels); 23,100,000 imperial bushels are produced by the Grand Duchy of Finland, 57,750,000 imperial bushels by the Caucasus, and lastly 75,075,000 imperial bushels by Siberia and Turkestan.

Of the total quantity of grain produced by European Russia, 92.3 per cent., or 87,150,000 imperial bushels, remain in the country, and serve not only for home consumption but for sowing; the remaining 7.10 per cent., or 132,000,000 imperial bushels, are exported both by sea and land, and go to stock the different markets of Western Europe.

England, the grain-importing country *par excellence*, is also the principal buyer and consumer of the cereals produced by Russia. The greatest part of the cereals exported from Russia, as well from the Baltic ports as by way of the Black Sea and the Sea of Azoff, and even by land, is intended for Great Britain.

France and Italy take the corn exported through the southern ports. Germany provides herself from Russia, both by land and through the Baltic ports. However, part of the Russian grain sent to Germany only passes in transit through the Prussian railways, to be sent to England from Prussian ports. As regards other countries, they only receive Russian cereals indirectly and by accident; the commercial relations of these several countries with Russia are altogether insignificant, with exception of those of Holland and Greece, which sometimes take important quantities.

Besides exportation, comprising nearly three-sevenths of the corn circulating in the different Russian markets, there exists in Russia a great home movement, the object of which is to provision, by means of the remaining four-sevenths, the other parts of European Russia less favoured with respect to production, and unable to provide for themselves. As regards production compared with population, Russia must be divided into three large zones, one of which —the northern and a portion of the central zone— produces less corn than suffices for local consumption; the second, that of the west, and part of the east, produces no more than sufficient to enable it to dispense with foreign aid; and lastly, the third, the great zone of the celebrated black land, or tchernozème, the zone which embraces twenty-six governments, as well in the centre as in the south, in the south-east as in the south-west (the Kingdom of Poland, though deprived of black land, must also be comprised in this third region), and where the production suffices not only for local consumption, but also feeds the first of the above-mentioned regions, and by itself alone furnishes to commerce and for exportation all that is not required for Russian home consumption, an amount the importance of we have indicated above. It is then, to this part of Russia alone, exceptionally favoured in respect to soil and climate, that we are indebted for the large mass of cereals of all kinds which supply our internal markets and provide for exportation.

The total area of European Russia, including the Kingdom of Poland, is estimated at 1,236,000 acres.

This vast extent of territory contained in 1875 a population of 71,736,980, which is not more than 14.3 per square kilometre.[*] Although these figures represent an arithmetical average, they are not to be regarded as absolutely correct, inasmuch as the density of population varies enormously in the different regions and provinces of Russia. In certain provinces of the centre and south-west the population amounts to 45.50 inhabitants per kilometre, whilst in the regions of the north and east there are less than 5.1 of inhabitants per kilometre. Still, keeping in view the three principal zones mentioned above, we find in respect to the first that in a compass of 1,957,317 kilometres, with 15,404,052 inhabitants (8 per square kilometre), there is an average production of 76,656,000 hectolitres[†] (210,804,000 imperial bushels), which is equivalent to 4.97 hectolitres for every inhabitant.

Considered under the point of view of cultivation, the arable lands in Russia should be divided into three categories—fallow land, land used for the production of cereals, and land producing oleaginous and leguminous plants, root plants, fodder, special products, &c. Considering the predominance in nearly every part of Russia, except the southern region, the Kingdom of Poland, and the Baltic provinces, of the triennial rotation of crops, the extent of fallow land is very considerable. The extent of the land devoted to agricultural plants other than cereals, considering that it cannot be fixed at more than 4,368,000 hectares,[‡] which corresponds to 4.21 per cent. of the quantity of arable land, to express the extent of the land devoted to the cultivation of cereals (inclusive of peas, which statistical accounts do not admit of our separating from cereals), we have the statement of 65,520,000 hectares, an area presenting the 63.16 per cent. of arable land, 40 per cent. of agricultural area, and 13.62 per cent. of the total soil of Russia.

Cereals in their turn being divided into winter and summer cereals, we ought to make a distinction between the quantity of land employed in the cultivation of those different kinds; and we find 31,286,000 hectares, or 30.15 per cent., of arable land annually devoted to the cultivation of winter cereals, and 34,234,000 hectares, or 33 per cent., of arable land used for summer cereals. If to the quantity of land under cultivation of summer cereals we add the land sown with plants other than cereals, and which for the greater part are not winter plants, we find not less than 37.2 per cent. of arable land employed in the cultivation of summer plants; consequently there is not only a larger area devoted to winter cultivation, but also of fallow land.

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[*] A kilometre is about 1,670 yards.

[†] A hectolitre is 2¾ imperial bushels.

[‡] A hectare is about 2½ English acres (2,471).

This absolute and relative predominance of summer cultivation is explained by the fact that in the south of Russia, in the region of the steppes, winter plants are scarcely ever cultivated, and the mode of cultivation prevalent there excludes even the fallow, the uncultivated steppes producing generally, during the years when they are cultivated, only summer plants, such as wheat, flax, millet, &c., and remaining during the rest of the time in the category of undefined lands, pastures, and meadows. Summer plants have the advantage over winter plants in Poland also. As a general rule it may be admitted that the production of winter corn increases in proportion as we advance from north-east to south-east, giving place to summer plants in a direction nearly parallel to that of the isothermal lines, or lines of equal temperature. Amongst the cereals cultivated in Russia rye holds the first place, in consequence of the extent of the land it occupies. It occupies not less than 42.97 per cent. of the land annually devoted to the cultivation of cereals; rye alone takes in nearly the whole of the fields reserved for winter plants, for the area devoted to the cultivation of winter corn is relatively very restricted, the latter occupying no more than 4.78 per cent. of the land devoted to cereals. Amongst summer cereals oats hold the first place; they occupy not less than 21.11 per cent. of the land devoted to cereals. After oats comes summer wheat, which occupies 12.90 per cent. of these lands; then barley 9.44 per cent., buckwheat 7 per cent., millet, maize, &c., which take up the rest of the land, or 1.8 per cent.

Such is the relative importance of the cultivation of the various kinds of cereals in Russia according to the extent of the land devoted to each of these plants. They may be classed in a rather different order, if we take into account the relative importance of the product of these various cultivations in the Russian home and foreign trade. From the latter point of view it is no longer rye which holds the first place, but wheat. For this reason we proceed to a more special examination of the various cereals cultivated in Russia.

WHEAT.

Notwithstanding its importance to the agricultural produce of Russia, wheat is a plant the cultivation of which is far from being general there. Although the limit of wheat extends from north-east to north-west, to the 59th, 61st, and 62nd degrees, and in Finland even to the 63rd degree of latitude, the cultivation of this cereal is unimportant, except in the regions of the south, south-east, and south-west, and partly in the centre of Russia. This forms the real wheat region, approaching in its northern part, which nearly corresponds with the northern limit of the region of the black land, the grand region of the predominant cultivation of rye, a region which, with few exceptions, embraces all the northern part, as well as the north-east, north-west, and centre of Russia, destitute of black land.

According as the summer cultivation of wheat predominates over that of winter wheat, the dominant region of the cultivation of wheat in Russia ought to be divided into two distinct and separate parts. The cultivation of winter wheat predominates in the northern part of this region, as also to the west of Russia and in Poland. The cultivation of summer wheat is restricted to the southern part and all the region of the south-east of Russia. In all the other parts of the empire which do not enter within the circumference of the wheat zone the cultivation of this plant possesses only secondary importance, appearing only sporadically, with exception of a few localities in the north-west, the Baltic provinces, &c. Summer wheat is cultivated by preference in these localities. The cultivation of summer wheat predominating throughout the vast regions of the south, it is the latter variety of the two sorts of wheat which possesses the greatest importance in Russia, as much by the extent of territory devoted to it as by the mass of products which it furnishes for consumption. Thus, of the 11,575,000 hectares annually occupied in the cultivation of wheat in Russia, the part assigned to winter wheat is only 3,134,000 hectares, whilst the cultivation of summer wheat occupies not less than 8,441,000 hectares.

We know that, in respect to its botanical properties wheat (triticum) is a species which is generally divided into four principal classes, established by Vilmorin, and at present adopted by the majority of *savants* who have occupied themselves with this question, amongst others by MM. G. Henje and Haberlandt. These four classes are:—

1. Vulgar, or ordinary wheat or corn (Triticum sativum Lomm s. vulgare Willd).
2. Hard wheat or corn (Triticum durum, Desf.).
3. English wheat or corn (Triticum turgidum L.); and
4. Polish wheat or corn (Triticum Polonicum).

To the wheat species belong also the different varieties of spelt, which are divided into two or three classes, which we mention here only for the purpose of placing them on record. These classes are: Spelt (Triticum spetta), starchy grain (Triticum dicoccum, shank), and (Triticum monococcum L.). Compared with wheat, properly so called, these varieties possess only a secondary importance.

Along with the botanical classification there is also another, based on the character and chemical composition of wheat. This classification, established by M. Million, is nearly as important as the first from a practical point of view, especially in relation to commerce, and the utilisation of wheat for grinding. According to this classification, the different varieties of wheat may be referred to three great classes, viz.:—

1. The kinds consisting of hard grain.
2. The species consisting of half-hard grain; and
3. The species consisting of soft grain.

The characteristic properties of these various kinds are sufficiently well known to dispense us from any necessity of treating of them here. We shall merely remark that the chemical classification does not correspond with the botanical classification, and that varieties of wheat botanically different often belong to one and the same category of hard or soft wheat, and *vice versâ*. On the other hand, the various kinds of wheat mentioned above are subject to infinite variations, lose or gain, according to the method of cultivation, the influence of soil and climate, &c., and the properties which characterise them both in a botanical and chemical point of view. The fluctuation of these properties and their frequent transformations prevent any more ample classification of the various kinds of wheat cultivated in a country, especially when the country is so large as Russia, and presents so many conditions so different in every respect.

We shall restrict ourselves, then, rather to the practical than the theoretical division of the various kinds of wheat cultivated in Russia, of winter and summer wheat. Although this division rests on no scientific basis, and it is incontrovertible that certain varieties of wheat may be cultivated, and are in reality cultivated, both as winter and summer wheat, nevertheless this division must be adopted in Russia more than elsewhere, for the very method of cultivation of both the winter and the summer species varies very much in that country.

The predominance of one or other of these kinds (winter or summer wheats) is not accidental, but depends on causes the existence of which is found in the physical climate or econonomical conditions of such or such a part of Russia; what is more, this predominance characterises even up to a certain point the entire method of cultivation in use in such or such a region, and serves as a basis for the division of the whole region occupied by the cultivation of wheat in Russia into two distinct parts, as before indicated.

We have already shown that the winter cereals occupy more than 30 per cent. of the arable land of Russia, an area which nearly corresponds to 48 per cent. of the land devoted to the cultivation of cereals. Of this quantity nearly 90 per cent. belongs to rye, and 10 per cent. to winter wheat. But this statement can only be considered exact in relation to the whole Russian empire, without taking into account the different regions where the cultivation of winter wheat is more or less important. Thus, if we take into consideration only the comparatively restricted region to which the cultivation of this cereal is limited, its importance in the rural economy of these regions will appear to us very different. For instance, there are certain localities in the governments of Jambow, Voronège, Orel, and Koursk, and in the south in Podolia, at Kiew, and in Poland, &c., where winter wheat occupies no less than 25 to 30, and even as much as 50 per cent. of the land devoted to the cultivation of winter wheat. There are certain private farming operations in which winter wheat occupies a place equal to, and sometimes larger than, rye. Everywhere winter wheat is found to be the plant which it is preferred to sow immediately after manuring, and which in that case yields the most brilliant results.

The sorts of winter wheat cultivated in Russia belong almost exclusively to the class of common wheat (Triticum vulgare); in some localities only, in the provinces of the west, we find, side by side with this variety, some rare samples of English wheat. The number of the different varieties of corn of these two classes amongst winter wheat is not very considerable; with respect to the conformation of the grain, the varieties of winter wheat cultivated in Russia ought for the most part to be classed amongst the soft wheats; it is only in certain localities and under the influence of certain climatic causes and special properties of the soil that we find varieties of winter wheat approaching to the semi-hard and nearly hard wheat.

It is a fact well worthy of remark that hard lands, not manured and recently put under cultivation, as still found to a great extent in the region of the steppes, produce, especially in relatively dry years, a kind of hard or semi-hard corn. The same lands, mellowed by larger cultivation and more or less abundantly manured, produce, especially during wet years, soft corn. The chemical composition of the wheat grains is equally subject to great variations, in consequence of the climatic influences, in connection with particular properties of the land. Thus species of winter wheat, differing little or not at all botanically, present, according to a series of analyses made by M. Liaskovsky on Russian wheat grains of different origin, the following variations occur with respect to the aspect and composition of the grains :—

1. Winter wheat, of the north-west of Russia, government of Vilna. Character : soft wheat, grain of medium size, floury.

COMPOSITION.

In 100 parts of normal grain :—	
Water	12.36
Nitrogenous matter	11.28
In 100 parts of dried grain :—	
Nitrogen	1.95
Fatty matter	2.23

2. Winter wheat, centre, region of the Black Land, government of Riazan. Character : semi-hard corn, grain of medium size, deep colour.

COMPOSITION.

In 100 parts of normal grain :—	
Water	10.73
Nitrogenous matter	18.81
In 100 parts of dried grain :—	
Nitrogen	3.51
Fatty matter	1.31

The variations in the chemical composition of the grains of wheat, even belonging to one and the same species, under the influence of different meteorological conditions and the state of the soil, will appear to us still more striking if we take into consideration the following data, the results of analyses recently made in the laboratory of the Foresters' Institute, of St. Petersburg, under the guidance of Professor Latchinow, on the initiative of the writer of the present notice, and on samples furnished by him, coming from the government of Voronège, belonging, without doubt, to one and the same species, and gathered on one and the same field, the first in 1874, a favourable year in every respect; the second in 1877, a year in which corn suffered from the drought of the summer. The land on which these two samples were produced was, in 1874, hard and compact, for it was the first year of its cultivation after eight years of fallows; in 1877 it had been mellowed by three consecutive years of cultivation, although not yet manured.

The following are the results of these two analyses :—

In 100 parts of normal grain :—

First Sample.

Water	11.81
Starch	67.57
Dextrine	2.39
Cellulose	1.57
Nitrogenous matter	14.25
Fatty matters	1.63
Ashes, amongst which phosphoric acid	0.78
Total	100.00

Second Sample.

Water	12.14
Starch	64.76
Dextrine	0.96
Cellulose	1.83
Nitrogenous matter	17.87
Fatty matters	1.57
Ashes, amongst which phosphoric acid	0.87
Total	100.00

In 100 parts of dried grain :—

Nitrogen	2.55 per cent.	3.22 per cent.
Fatty matters	1.83 ,,	1.77 ,,

It is, then, absolutely impossible to establish any classification of the varieties of wheat cultivated in Russia on the chemical composition of their grain. Besides, it would be all the more difficult, as, in general, agriculture has no means within its reach of accounting for such composition, as the outward character of the grain does not always coincide with the grain outself. It is rather according to their origin that the various species of wheat are distinguished, as also according to the outward character, aspect, size, and colour of the grain, configuration of the ear, &c.

Thus, amongst the varieties of winter wheat with which we have now to deal, we distinguish the ordinary winter wheat, which takes different denominations, according to the localities where it is cultivated, red-eared corn, Sandomir corn, &c.

In the collection of Russian grain which figured in the Russian agricultural section at the Paris Exhibition of 1878 ordinary winter corn was represented by many samples, from which it was easy to form an idea, more or less exact, of the character which winter wheat represents in the various parts of Russia. But it must be considered that the year 1877 was not at all favourable to the formation of all kinds of cereals, which suffered greatly from a phenomenon rather common in the South of Russia, called in France the *ventaison des blés*; consequently some of the samples exhibited were far from being so fine as they might have been, and ought not to be considered as absolutely typical.

The greater part of the corn exhibited (winter corn) comes from the centre of Russia, where its cultivation, as we have said, attains the highest importance. It is the governments of Toula and Voronège which furnish the largest number of specimens, amongst which we notice particularly those exhibited by M. Schatilow and M. Levschine as being the most characteristic. It was curious to compare the sample of corn exhibited by M. Schatilow, and coming from the government of Toula (centre), with another sample exhibited by him coming from the Crimea (south). A sample of wheat exhibited by M. Donkhinovv, the origin of which is not named, represents the wheat of commerce as exported from the port of St. Petersburg.

The south-west part of Russia, the government of Kiew, which is amongst the number of those where winter wheat has attained the greatest importance, and is especially distinguished by the beautiful quality of its products, only furnished one exhibitor, M. Zablotsky, in whose collection we remarked a species of wheat known by the name of *blé à épi rouge* (red-eared wheat), a species widely diffused in Russia. We found it in the collection of the Gorki farm as well, government of Mohilew (this farm belongs to the Ministry of Domains, and is connected with a school of agriculture bearing the same name). The red-eared wheat, however, is far from having the same value as the Sandomir wheat, a type altogether different, which figured in M. Zablotsky's collection, and in that of several exhibitors from Poland. The Sandomir wheat, which owes its name to a small town of the government of Radem (Poland), in the neighbourhood of which it was originally cultivated, has acquired, especially during late years, great celebrity, and its cultivation has extended far beyond the limits of its original birthplace. Out of Poland Sandomir wheat is cultivated on a large scale in the government of Kiew, in Volhynia, and in Podolia, where it seems perfectly to retain its original qualities, which are whiteness, fineness of epidermis, fecular richness, &c. Further on, towards the south and east of Russia, Sandomir wheat degenerates and assumes more and more the character of hard wheat, which is its decided antithesis. It is found also in some localities of the north-west of Russia, where, however, it fails to preserve its original fine qualities. The farmers of Poland send now annually a tolerably large quantity of Sandomir wheat in the neighbouring provinces of Prussia and Austria, where the cultivation of this fine species extends more and more. The port of Odessa also exports a large quantity of it.

Outside the provinces of the centre and west the cultivation of winter wheat only appears in some isolated localities of Russia, without attaining to any great importance. This we find it in the government of Moscow, a proof of which is afforded by the collection of the Petrovsky farm, near Moscow. (The Petrovsky farm belongs to the Agricultural Academy of Petrovsky-Resonmovsky, and is about half an hour's journey from Moscow.) This farm furnishes the type of a model cultivation, and attaches importance to the production of the finest kinds of grain, which it sells afterwards to Russian farmers as seed. We found, in the rich collection of grain exhibited by this farm, samples of different sorts of winter wheat imported and more or less distributed by it amongst a large number of farmers who go there to supply themselves.

Of these kinds there are, amongst others, the Prolestein wheat, of German origin, the Frankenstein wheat, &c. The Prolestein wheat has a certain reputation amongst Russian farmers; it is extensively cultivated there, and it is found in most of the improving lands. The Petrovsky farm seems to have proved, moreover, that the lucrative cultivation of winter wheat is quite possible in this part of Russia, where there is not much of it sown, and where, in general, the soil is only of medium fertility. It reports that the land yields, on an average, 16½ hectolitres per hectare (45½ bushels per 2½ square acres *nearly*), which is a great deal in comparison with the ordinary yield of wheat in these regions, which is not more than 6½ hectolitres.

In the Russian central wheat region, especially where summer wheat is cultivated side by side and parallel with winter wheat, where the climate is more humid and temperate and the soil well tilled and mellowed, the cultivation of soft wheat predominates. The two principal varieties are the *Ghirka*, or bald wheat (without beard), and the red-eared wheat (krasnokoloska), which are much esteemed by agriculturists on account of the fine quality of the grain and the quantity and great nutritive value of the straw and bran obtained. They are not very exigeant with regard to soil, although the grain of the bald ghirka is liable to run, if not harvested in time. The weight of the ghirka varies from 56 lbs. to 63 lbs. per bushel. In hard new soils the ghirka sometimes partakes of the character of half-hard wheat, its weight increasing to 65 lbs. per bushel. The ordinary ghirkha and the red-eared wheat were represented at the Paris Exhibition by specimens from the governments of Voronege and Moscow. Wheat of the same variety, but generally much finer, is obtained in the governments of the south, viz., Kharkow, Ekaterinoslav, Kherson, and Tauris, where the ghirkha replaces the hard varieties according as the soils become more mellowed by cultivation and less suitable for the production of hard wheat. The ghirkas exported from Odessa are very fine and highly prized, as shown by the sample exhibited by the Committee of the Odessa Exchange. A variety of wheat very analogous to the ghirkas in the character of its grain is the ordinary Russian or bearded wheat, from the eastern governments bordering on the banks of the Volga, where, in like manner with the ghirkas in the south, it takes the place of the hard wheats, according as the virgin soils become mellowed by a prolonged cultivation. Although this Russian wheat does not possess as high a commercial value as the ghirka or the different varieties of hard wheat, still it is sometimes very fine, especially in the government of Saratov, as was seen from the specimens exhibited in the collection of the Marie Farm and by Mr. Pliguine. In the government of Astracan, where the wheat exhibited by Mr. Ouprianow is grown, the cultivation of this variety is only of secondary importance. As an intermediate kind between the soft and hard wheats, we may mention the pererod, or degenerated wheat, chiefly grown in the governments of Saratov and Samara. It does not present any regular botanical variety, as it approaches the hard or the soft wheat, according to the character or state of the soil and the number of years of its cultivation. Thus, in the government of Saratov, hard wheat, when sown on soil which has been under cultivation for more than six years, is said to produce a half-hard degenerated wheat (pererod). The pererod wheat preserves many of the good qualities of hard wheat, and may be cultivated with success in mellow soils where the original hard wheat would not succeed. It is highly prized for this quality by the agriculturist.

The *Saxon Wheat*, a variety of tender wheat much valued in the St. Petersburg market, owes its name to the numerous German colonies on the banks of the Volga, in the governments of Saratov and Samara. The German colonists have preserved the old traditions of a careful and rational system of cultivation, and on the extensive lands granted to them by the Empress Catherine II. of Russia they grow considerable quantities of fine wheat, which is sent to St. Petersburg under the name of Saxon Wheat. A characteristic specimen of this variety was exhibited by Mr. Donkhinow, of St. Petersburg.

Among the varieties of soft wheat which are but little cultivated in Russia, and which are distinguished by their original character, we may mention the *Coubine Wheat*, cultivated in the north of Russia, in the government of Vologda, on the banks of Lake Coubine; and the Kostroma Wheat, originally from the Kostroma government, but recently introduced into Poland, where it enjoys a high reputation, and where its cultivation is daily extending. Specimens of this curious variety were shown in the collections of several exhibitors from Poland.

We now come to the hard wheats, which are mostly produced in the southern region of the black soil, and more especially in the southern part of the region of the steppes. It is to these different varieties of hard wheat that the Russian wheat owes the reputation it enjoys in the South of Europe, as well as in the southern ports of France. (England prefers to buy soft wheats, and principally the ghirka, Saxon, and winter wheat.)

Although known under a greater variety of names than the soft wheat, the genuine hard wheat (*Triticum durum*) possesses a pretty regular character from a botanical point of view. It is always bearded, has square ears more or less flattened; the grains are of a beautiful amber yellow, with a glazed appearance (except in cases of degeneration), long, and of a triangular form. The cuticle is very fine, and the weight varies from 60 lbs. to 68 lbs. per bushel. These characteristic features of the *Triticum durum* vary so little in the different varieties that the names by which they are distinguished may also be considered synonymous; we will, however, mention the principal ones.

In the south-western region of the black soil, from the banks of the Don to the Volga, and even as far as the Ural Mountains, we find a splendid variety of hard wheat, known by the name of *Koubanka*, or *Kouban Wheat*, and sometimes by the name of *Bielotourka*. The samples of these varieties exhibited have been obtained from three districts quite distinct and removed from one another, viz., the *Bielotourka*, from the government of Voronege, the same variety from the country of the Cossacks of the Don, and the *Koubanka*, from the government of Astracan. The *Bielotourka* sometimes takes other names, and varies more or less in respect to the size of the ear, colour of the grain, &c. The *Krasuotourka*, a reddish wheat, is highly prized and extensively cultivated in some parts of the government of Samara.

All these varieties succeed best in good, compact lands, with an argillaceous or calcareous subsoil. To the south and south-west, from the banks of the Don to the Danube, a variety of hard wheat, very similar to those already mentioned, is cultivated, and known as *Arnaoutka* or *Arnaont* wheat, which is again divided into several sub-varieties, as the *Garnovka* or *tourka*, a variety much esteemed; *the black-eared Garnovka*, considered the best of all; the bearded *Arnaoutka*, &c. All these different varieties are commercially known as Tanganrog wheat. The Committee of the Odessa Exchange exhibited several of these varieties.

Mr. Schatilow exhibited a specimen of *Arnaout* wheat from the government of Tauris, and Mr. Firsow exhibited the same variety from the government of Voronege. Notwithstanding the great natural fertility of the land in Southern Russia, the average yield of summer and winter wheat does not exceed 8¼ bushels per acre; in the provinces of the south-west (Kiev and Podolia) it is rather higher, sometimes exceeding 9 bushels per acre, declining to about 7¼ bushels per acre in the steppes of the South of Russia, a very fertile district, but subject to frequent periods of drought, and where the method of cultivation is of the most primitive kind. The quantity of seed used per acre varies from 1½ to 1¾ bushels in the south to 2¼ bushels and upwards in the centre and north of Russia. Sowing in drills is still but little employed.

It is absolutely impossible for us to estimate the production of the different varieties of wheat in Russia; even the official statistics leave much to be desired with regard to exactitude, and should be increased by at least 10 per cent. This would show the production to be 79,500,000 hectolitres, about 84 per cent. of which is grown in the region of the black soil and only 16 per cent. outside that region. After deducting from the total the quantity of grain necessary for sowing the land, which may be fixed at 19,477,500 hectolitres, we find the nett production to be 60,022,500 hectolitres, corresponding to 84 litres per inhabitant. As the consumption of wheat in the interior does not exceed 56 litres per inhabitant, there would remain an average annual surplus of about 20 million hectolitres (55,000,000 imperial bushels) for export. The following table will show the average yearly exports for quinquennial periods from 1836 to 1875, from which it may be seen that the amount exported has continually increased, especially since 1861, the year the serfs were liberated :—

	Imp. bushels.
1836 to 1840	11,954,000
1841 ,, 1845	12,323,000
1846 ,, 1850	20,136,000
1851 ,, 1855	18,353,000
1856 ,, 1860	22,018,000
1861 ,, 1865	28,948,000
1866 ,, 1870	44,217,000
1871 ,, 1875	53,192,000

Up to the outbreak of the Russo-Turkish war the proportion of exports for every 1,000 parts was divided as follows :—

From the White Sea	0.05
,, ,, Baltic	90.35
,, ,, Sea of Azov and Black Sea	809.35
Overland	100.25

The various importing countries of Europe received it in the following proportions :—

England	492.5
France	200.1
Italy	92.7
Prussia	83.1
Turkey	77.8
Austria	23.4
Holland	2.8
Sweden and Norway	0.5
Other countries	27.1
Total	1,000.0

The different varieties of spelt are only of secondary importance. We may name among them the Polish wheat (*Triticum Polonicum*), which is met with on some farms, but more as a curiosity than otherwise. The *Triticum Spelta* is sometimes cultivated in the central and eastern governments; it is also met with at Penza Toula, Tambow, in the governments bordering on the Volga, and farther north at Tver and Novgorod. The classes of wheat known as starchy wheat (*Triticum amyleum*), and small bearded wheat (*Triticum monoccocum*), may be seen in certain districts of the governments of Kharkov and Ekaterinoslav, in the Crimea, and Caucasus. The small bearded wheat is highly valued by the Tartars of the Caucasus, who cultivate it as a winter plant.

The wheat grown in Russia in the districts already mentioned is further concentrated in those places where the large milling establishments are situated, among which may be named Yeletz, Koslov, Orel, and Koursk, in central Russia; Kolomna and Serpoukhov, in the government of Moscow; and Odessa, in the south, one of the great centres of the Russian milling industry, where there are splendid steam mills, which produce a very fine flour, principally for export. Up till quite recently the greater number of these mills only worked for the home consumption, but at present the export flour trade is being gradually developed, and tends to increase from day to day. The quantity of flour exported from 1857 to 1860 was only about 26,000 tons, valued at 1,362,000 roubles, whereas the present annual export amounts to nearly 75,000 tons, valued at over five million roubles, and divided between the various importing countries in the following proportion :—

Sweden and Norway	353.20
Turkey	304.30
England	163.10
Austria	24.80
Holland	18.90
Prussia	17.40
France	9.50
Italy	1.10
Other countries	107.70
Total	1,000.00

Besides flour there are upwards of 11,000 tons of bran annually exported.

Russia being the largest grain exporting country in Europe, it is easy to judge of the relative importance of the Russian agricultural industry, which appears equally important, whether considered only in regard to the interests and benefit of Russia, or from the more general point of view of international interests and the welfare of all Europe.

The Farmer's Kitchen and Economical Cookery.

By Hugh Clements.

A GREAT deal has of late been said and written upon the subject of cookery. A School of Cookery has been established for a few years at the Exhibition Road, South Kensington, where ladies of the middle or higher classes, as well as cooks and prospective cooks, provided they can afford to pay the fees and give the time, can learn the *modus operandi* of the preparation of food. At this school the professional cook may learn much that will be useful, and enable her to prepare a more economical and nutritious dinner than she otherwise could do, by the application of scientific or chemical principles to the cooking. Of course cooks as a rule know nothing about chemistry, and the composition of the various kinds of food, and those of the old school have learnt to cook in an empirical manner, or by the rule of thumb.

At such schools cooks are not taught chemistry, or the constituents of which the various foods are composed, but they are taught to cook food just as if they knew all about heat and other sciences. In fact, good cookery is founded on a knowledge of the chemistry of foods and on a grasp of the scientific principles involved, and bad cookery is not founded on any principles at all. With bad cookery food is wasted and the stomach more or less injured, but good cookery renders any food mose digestible and more nourishing than it otherwise would be. As the school spoken of above will never be able to reach the working or poorer classes for obvious reasons, domestic economy and cookery should be taught in every primary school in the United Kingdom to the girls, so that they would, when they grew up and got married, be enabled to make the most out of small means, and to cook a nutritious meal, and not spoil their scanty supply by bad cooking. I venture to say from my experience; that by the ignorance of domestic economy among the housewives of the artizan and labouring classes, enormous and incredible quantities of food are wasted by bad cooking, and by the food not being properly utilized.

A knowledge of cookery would in my estimation be far more useful to prospective wives or prospective cooks and others, than any amount of grammatical or geographical knowledge that is usually given at schools.

Next to the three R's, a knowledge of cookery is the most important to girls in their after life. The allotted place for women in this country appears to be in the house, managing its affairs to the best advantage, while that of the man is to earn money by some profession or trade, to pay the expenses of the home. The husband should be the food winner, and the wife the food preparer. The better the education of the husband, and the more he knows of the scientific and technical principles upon which his trade or profession is founded, the more successful will he be as a bread winner. And the more the wife knows of domestic economy and household management, as founded upon correct scientific and technical principles, the better will she be enabled to be a good preparer of the food which the husband has enabled her to obtain. Ladies of the middle and higher classes should also be competent to cook a good meal, and fully understand the theory and practice of cooking, so that they may be enabled to direct and superintend their cooks as occasion requires. They should also consider it a part of their daily duty to visit the kitchen, to see that the cook has all her utensils in proper working order, that there is no waste of material, and that the most approved methods of cooking are practised. As a rule, if the cook is at fault, it is the result of ignorance and not of carelessness; and the mistress should, with a gracious and pleasing demeanour, point out her mistakes (if any), and show her how to prevent their recurrence. Farmers' wives are placed in this relation to their cooks, and it is very important that they should be capable of superintending them, so that every particle of food may be utilised; for I fear that as farmers obtain much of their food at first cost, that is, the cost of production, there is a tendency to be rather wasteful. However, I hope that one good result of the present depression will be to cause greater care in the utilisation of food.

Nothing should be wasted; the trimming (bones) of the meat should be used for stock and glaze, which are both made by the digestion or boiling of bones broken in small pieces as a preliminary process. The skimmings obtained when boiling meat may be utilised instead of lard or butter. The superiority that is claimed for the French cooks is due to the utilisation of portions of food that are only too frequently thrown away or wasted in the country. They do not waste food by roasting large joints that cannot be all consumed while hot, and they claim a superiority in the production of a more palatable and a more nutritious meal from smaller means. The French also cook their meat longer than we do, and increase the number of dishes by destroying or altering the flavour by the introduction of others. The French consider the prolonged cooking increases the digestibility of the meat, while the English do not like meat overdone, so that this matter is a question of taste, and no superiority can be claimed on either side. Many years ago the English in their own estimation, were superior to all the Continental nations in almost every acquirement; but now there seems to be an over-estimation of Continental abilities. It is the fashion now for Englishmen, when they go to the Continent, to take an Utopian view of European and deprecate English capabilities.

Cookery forms no exception to this rule, for the French are wonderfully praised by many for the art displayed by them in the preparation of food; but whether they are entitled to the meed of praise that is showered upon them, is another question, as it is a disputed point whether they can justify their claim for general superiority in this respect. It does not follow, because they eat less animal food than we do, that they make the little they can afford to have go further, for it is a well-known fact that they amply make up for any deficiency by an extra consumption of vegetables and salads. With regard to the cooking of food, our cooks have the same receipts and understand the French methods and principles of cookery, if they chose to adopt them in detail; but we do not appreciate all their flavours, and do not always approve of their cuisinal methods, considering our own superior. The French method of frying is vastly superior to ours in principle and in economy, except in the preparation of steaks; and perhaps this is the only point upon which they can claim any advantage over us. As Englishmen generally do not err on the score of eating too little, they do not require the excuse of an excess of flavours to tempt an already overburdened stomach. Thus the French use of flavours tends to prove an inferiority rather than any superiority.

Most of the French dishes that are worth eating are cooked upon similar principles to our own, and only differ in the high-sounding names that are applied to them, which, together with the novelty of partaking and professing to enjoy an unusual fare in a strange country, leads inexperienced Englishmen when travelling in France to send letters to the *Times*, extolling the foreign and abusing the home cookery. In fact, the principles of English and French cookery are much the same, but there is a variation in the application to suit the tastes and requirements of each nationality, and if we would only avoid all extravagance and waste of food material and introduce their method of frying, and perhaps use a little more soup than we do at present, we should equal them in cookery, which should be more generally taught, since bad or untrained cooks will spoil any system. The heads of establishments in the middle and higher classes should be able to appreciate good cookery and direct its performance when necessary. They should also be able to apportion the outlay for the different household requirements according to their income, or the amount that is allowed for housekeeping.

APPORTIONMENT OF HOUSEHOLD EXPENSES FOR A YEAR.

	£800			£400			£200			£100			£50		
Rent and Taxes.	110	0	0	60	0	0	31	0	0	15	0	0	9	0	0
Butcher.	60	0	0	45	0	0	30	0	0	15	0	0	4	0	0
Baker..	25	0	0	24	0	0	20	0	0	13	0	0	13	0	0
Grocery.	28	0	0	24	0	0	20	0	0	10	0	0	5	0	0
Green-grocery	14	0	0	9	0	0	7	0	0	5	0	0	3	0	0
Fuel....	25	0	0	18	0	0	10	0	0	7	0	0	3	0	0
Milk....	15	0	0	13	0	0	6	0	0	3	0	0	2	0	0
Butter..	12	0	0	10	0	0	5	0	0	3	0	0	2	0	0
Cheese..	5	0	0	4	0	0	3	0	0	1	0	0		—	
Beer....	15	0	0	11	0	0	4	0	0	1	0	0		—	
Wine and Spirits.	20	0	0	10	0	0		—			—			—	
Washing.	40	0	0	5	0	0	4	0	0	2	0	0		—	
Clothing.	100	0	0	50	0	0	18	0	0	12	0	0	4	0	0
Ed'cation	100	0	0	36	0	0	12	0	0	5	0	0	1	0	0
Life Insurance	20	0	0	10	0	0	5	0	0	2	0	0		—	
Fire Insurance	0	16	0	0	8	0	0	4	0	0	2	0		—	
Income Tax..	16	13	4	8	6	8	1	13	4		—			—	
Repairs& Extras.	24	0	0	12	5	4	8	0	0	2	18	0	3	0	0
Recreation...	29	10	8	15	0	0	5	0	0	2	0	0	1	0	0
Doctor..	40	0	0	10	0	0	3	0	0	1	0	0		—	
Wages..	100	0	0	25	0	0	5	2	8		—			—	

This table will enable the housekeeper to form some idea of the approximative amounts that should be allowed for the various items of expenditure during the year from the weekly allowance, for each branch of outlay can be derived by dividing each amount by 52. If the result obtained is too little, it can be increased by those items which give too high a result, as the expenditure varies according to so many circumstances.

The household accounts should be kept with great care, in order that both the master and mistress may know exactly how the money for the house has been spent, so that all misunderstanding on this score may be avoided. And unless accounts are kept, it is impossible to check the accounts of the different tradesmen. With the butcher, for instance, it is a good plan to receive a ticket with each joint of meat, stating the weight and price, and check his account by these tickets. Every item of expenditure should be entered in a book, and the total made up each week, and an account should be opened in the ledger for the butcher, the baker, the fishmonger, the grocer, and so on, for each general head of expenditure, and made up monthly, quarterly, half-yearly, or yearly, as desirable.

In marketing there is often a considerable amount of unintentional extravagance from an ignorance of the quality of food and material, which are often purchased apparently cheap, while it is in reality dear. It is far more profitable to pay a little more for the best quality of food than to buy inferior, and it may be adulterated or tainted goods. An experienced person will generally buy good meat and other articles at a lower price than the inexperienced, since, understanding quality and value, they are enabled to make a better selection. But sometimes the cheapness of the purchase is more than compensated by travelling expenses and loss of time, so that it would be more economical to obtain a good article nearer home at a higher price.

By various systems of ready money dealing, customers are enabled to purchase goods from 25 to 10 per cent. cheaper than at the ordinary dealers who give a considerable amount of credit, and encourage this system by allowing no discount for cash payments. Goods that will keep or improve by keeping should be purchased in large quantities when cheap, provided there is sufficient space for them. A saving might be effected in laying in a large supply of coals when cheap, but in many households only small quantities can be stored. It is advantageous to buy soap and candles in large quantities, as they may in this way be obtained cheaper, besides, they improve by keeping; but tea loses aroma, and sugar loses weight, by keeping. And children and servants are liable to waste groceries when provided in large quantities. However, the experienced household manager will know how, when, and where to buy groceries, &c., and the quantity of each article. A considerable amount of judgment should be displayed in the purchase of butchers' meat for a family, in order that there may be no eventual waste. For instance, in a neck of mutton about one-half is fat, and one-sixth bone, and only two-thirds of this joint are utilized by those who do not consume the fat and throw away the bones. A leg of mutton is much more economical for small families in which the dripping is not used, as a considerable larger proportion of this joint is solid meat. The round of beef is much more economical than the ribs or sirloin, since there is proportionately much less bone, as will be seen by the following table. However, if the bones are utilised for glaze and stock, and the fat is used as dripping, the waste will be minimised:—

BEEF.

	Percentage of bone.	Approximate price per lb. without bone.
Leg of beef	26.7	0.10
Shin	25.3	0.9
Rump	21.7	1.3
Ribs (chuck)	21.2	1.1
Shoulder	19.3	0.10
Ribs (middle)	18.0	1.0
Sirloin	14.7	1.1
Ribs (best end)	13.4	1.2
H. Bone	13.2	0.9½
Thick flank	12.8	0.10
Round	9.5	0.11
Sticking piece	8.3	0.8

MUTTON.

	Percentage of bone.	Approximate price per lb. without bone.
Breast	14.5	0.9½
Shoulder	13.8	0.10½
Loin, chump end	11.2	0.11
Leg	10.6	1.0½
Loin, best end	10 3	1.0½
Neck, scrag end	10.0	0.9
Neck, best end	8.3	0.10

With regard to the quality of meat, there is a difference in the wholesale prices of between one-fourth and one-fifth, The meat of superior quality is in great demand at the shops patronised by the middle and upper classes, and the inferior joints are sold in poor neighbourhoods. The butcher accordingly alters his prices so as to suit the class of customers he has to deal with, by raising the prices of his legs of mutton and sirloins of beef, and lowers the necks. It is necessary to use both the eye and the hand in selecting butchers' meat. When beef is cut through, it should be of a reddish blue colour, becoming florid red on exposure to the air. In the sirloin, ribs, or rump, the grain should be fine and smooth, and the fat white and firm. And hard and old beef is elastic when pressed between the fingers, while tender and young meat is inelastic, retaining the impress of the fingers. In mutton, the leg is a very profitable joint, and so is the loin and the best end of the neck, but in the haunch there is a piece of flank that is not of much utility. The leg of veal is the most profitable joint of veal, and so is the fillet, which is the leg with the bone removed. The leg of pork is also the most economical joint, and as it is sold at about 2d. a pound cheaper than other meats, and as the fat does not melt away so much as that of beef or mutton, it is the cheapest meat for occasional family use. Pork should be examined to see that the fat does not contain enlarged glands, that the lean when pressed does not yield little specks of matter, that it is of a pale red colour, and is free from any unwholesome smell. In the purchase of all other articles required for the kitchen, the same care and judgment should be used so as to obtain good value for the money spent for food, which is too often wasted in rich families, for the cook too often not only wastes on her own table, but on the upstairs table as well. Considering their masters or mistresses are in the possession of unlimited means, they think it is mean and perhaps unladylike for the mistress to talk of economy in a family that can afford the best of everything, and almost any amount of waste and extravagance. At any rate, while the cook receives satisfactory wages, and is not stinted in food materials, she has no incentive to practise economy or thrift of any kind. The cook, therefore, having no interest in utilizing food, and perhaps a direct interest the other way, continues to pursue a system of wasteful and extravagant cookery, until some day she becomes the wife of a man who cannot provide the best joints every day in the week. As she has never practised economy or the methods of making the most of odds and ends, she cannot now do so, and with the husband's limited income she manages to feast him one dry in the week and starve him the remainder on a few scraps, which she has never learned how to properly utilise. As cooks, and often the prospective wives of the poor man, generally learn cookery in rich families, where there is unlimited supplies, it is not astonishing that there is too often and generally a wasteful and extravagant system of cookery practised in the homes of the poorer classes, who can least afford to bear the expense, having frequently to starve themselves to make both ends meet, simply because the wife does not understand the innumerable methods of cooking vegetables with a little fish or meat, so as to make a palatable and inexpensive meal substitute a more substantial one.

As the necessaries of life, especially food, form the first and paramount consideration of English families, it is high time to introduce instruction in the principles and practice of cookery in every primary school in the country, so that girls should be taught how to make savoury and nutritious dishes from the surplus produce of the farm or the moor. The French peasants can prepare a nutritious and healthy meal from a few simple food materials, and there is therefore the less reason for the English, especially the poorer classes, not to be able to do the same. Let the middle and higher classes make a determinate effort in order to introduce instruction in domestic economy and cookery into the Board and National schools, and they will doubtless be successful, and one of the first results of their labours will be an immense saving in the consumption, which will be equivalent to an increase of the produce of the country to the same extent. And as he who makes two ears of corn grow where only one grew before is a benefactor, how much more will they be benefactors who will enable the poorer or middle classes to make their provisions last longer and to render them more nutritive. In fact, the saving that could be effected in this country by scientific and economical cookery is equally as important as an increase of agricultural produce, but little or no saving can be effected until cooks understand the principles of cookery and nutritive values.

Agricultural Education.

By Hugh Clements.

IT is admitted universally that a good education is a most useful acquirement in any business or profession, and renders the possessor, when he utilizes his talents aright, a more useful, contented, and prosperous man than he would be if his education had been neglected.

There are few occupations or professions that require a knowledge of so many sciences, both theoretically and practically, as farming, and there is the practical experience and a practical knowledge of details that should be acquired by tuition under the superintendence of some farmer who is generally recognized as an able and successful cultivator, breeder, and general farm manager, or acquired at some agricultural college to which there is a farm attached, exhibiting the most approved methods of cultivation and management.

I shall not now enter into the reasons why agricultural education has been so much neglected, especially in England. For while an excellent system of agricultural education is administered under Government supervision in Ireland, England in this respect has been neglected. Of course there is the Agricultural College at Cirencester, but tenant farmers do not seem to appreciate as they ought this most excellent and well-conducted establishment, for obvious reasons. It is just the place to send the sons of tenant farmers; but what is one college among so many counties, and such a large country as England is, with its various soils and climates. Almost every province on the Continent has its Agricultural College and farm, and Ireland has almost forty model farms scattered over its length and breadth, more or less under the control of Professor Baldwin, the Government Director of the Glasnevin Model Farm, near Dublin. There are also about 170 National Agricultural Schools, at which schoolmasters give practical lessons on gardening and farming to the school children. In Ireland there are causes, without existence in England and Scotland that render the good effected by this system of Government agricultural training not so apparent and advantageous as it would undoubtedly be if administered in Great Britain. Still, it is universally admitted that the Agricultural Model Farms have successfully obtained the objects for which they were established, having exercised a very beneficial influence on the native agriculture. There are lectures given at King's University and King's College, London, at Oxford and Cambridge, and at academies in the provincial towns that are more or less suitable for agricultural students; besides there is a chair of agriculture at Aberystwith College, and of course there is the chair at Cirencester, and the Royal Veterinary College, London.

In Scotland, agricultural education is by no means neglected, as there is a Chair of Agriculture at the University of Edinburgh, at which many eminent agriculturists have been educated. Lectures on agriculture are also given at Aberdeen and the other Scotch universities. There are also veterinary colleges at Glasgow and Edinburgh. Scotch farming is a sufficient and satisfactory exponent of Scotch agricultural education, and agricultural students are boarded and educated by competent Scotch farmers.

Vigorous endeavours should be made immediately to introduce agricultural education especially in all rural districts, so that the rustics may imbibe a satisfactory knowledge of the scientific principles upon which agriculture should be based, as it is very important that the children of the small farmer and the labourer should acquire this kind of knowledge, since they are not permitted to bask under the genial and benign influences of Royal and other agricultural societies and educational schemes, unless they take the opportunity of attending the lectures given, or about to be given, to all who desire in rural districts, through the agency of the Government Science and Art Department, upon the principles of agriculture. If farmers are alive to their interests, they will encourage the extension of these classes over the length and breadth of England, by making application to the Department for their introduction in their respective districts, so that the labouring classes may be led to understand the principles of agriculture, and the reason why of every field operation, and of the successful treatment of animals and plants.

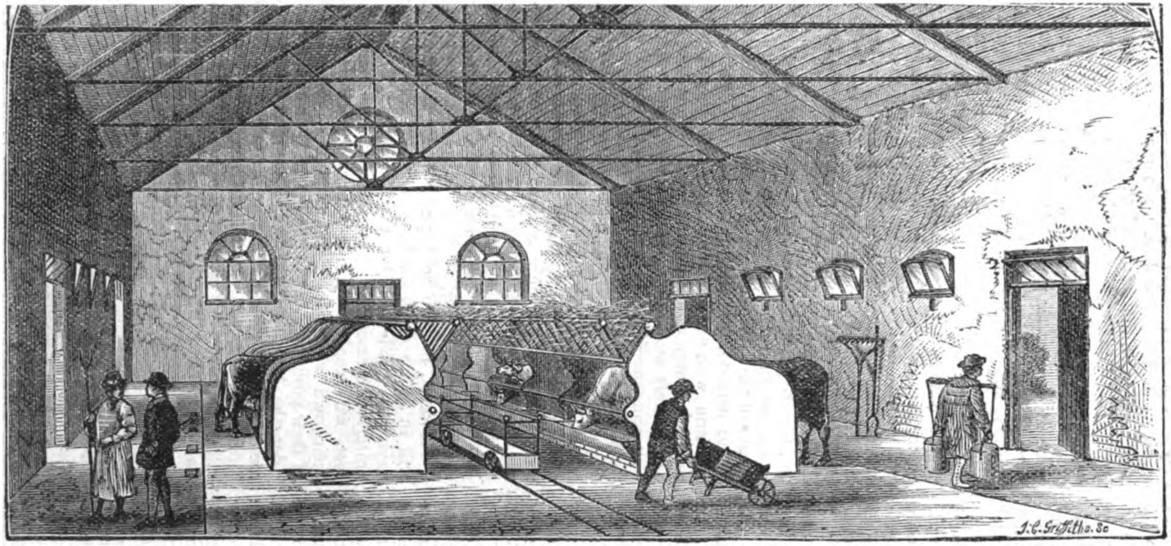
In promoting agricultural education we should begin at the lower stratum, and not at the upper. Of course, the education of the upper and middle classes is very commendable, but to neglect the education of those who are manually engaged in agricultural operations is reprehensible, and cannot be sufficiently condemned. Farmers should encourage their labourers either pecuniarily or persuasively to attend the science and art classes on agriculture, or use a little pressure with the recalcitrant or those of an indolent (mental) disposition, as the act of learning becomes more and more distasteful to those whose early education has been neglected, or those who have ceased to use their mental faculties in the acquisition of knowledge. Their understanding becomes dull, and their first efforts at comprehension are painfully laborious; hence they endeavour to avoid the pain, and enjoy those simple pleasures to which they have become attached by habit. They can plough, reap, and sow, and perform the other mechanical operations of farming, and understand how to treat and use animals to a certain degree; but these acquirements have been learnt by continued practice and the imitation of others. Without instruction in principles they will never become educated, nor advance one iota beyond their present system, or make any improvements. Those who have a practical knowledge of farming and the treatment of live stock derive far more benefit from attending lectures explaining scientific principles, than those who know nothing practically about it; since they can immediately grasp at what is meant, and can the more readily understand the principles involved, so that the lectures become supremely interesting, and what before seemed mysterious and incomprehensible, if it was ever thought of, now becomes clear and highly appreciated, leading the inquiring mind onwards from principle to principle, step by step, until he becomes a new man, a treasure to his employer, rising by degrees to a higher relative position.

It is an error to suppose that we can over-educate anybody, and more especially agricultural labourers and artizans. It is generally stated that they acquire high notions that unfit them for their present occupation. An agricultural labourer or an artizan who understands the scientific principles upon which his industry is based must rise in his profession. He is raised over the heads of his ignorant compeers, being as it were forced upwards by the dull and heavy beings around.

But if the mass, including the agricultural labourers, were educated as they should be, they surely would not all become inflated with such high notions; and if they did, the inflation would be general and beneficial, and the relative position of man to man would be unaltered—those, as now, who exhibited especial aptitude and abilities would rise the highest. The only difference would be that the social wave of civilization would rise higher, and the tone of society would be vastly improved, morally, physically, and intellectually.

Farmers cannot complain that elementary education is deficient, but their agricultural education has heretofore been sadly neglected. However, there is a bright prospect for the farmer, as this branch of education now commands attention, and endeavours will doubtless be made to initiate our prospective farmers into all the mysteries of the science and art of agriculture. It will require years to effect much transformation, and farmers must not be impatient at the progress of a renovation that is slow but sure. The State systems of the Continent, America, or Ireland might with considerable advantage be introduced into England. Agricultural colleges with farms attached should be established in most counties to which those young farmers who had obtained a knowledge of agricultural science and farming, by boarding with a good farmer or otherwise, should resort for a term of two years' study and practice. At such colleges they would receive instruction in practical chemistry, including analysis of soils, manures, &c., geology, and the formation and classes of soils, botany, including vegetable physiology, animal physiology, and zoology; mechanics, including a knowledge of implements and machinery; mathematics and its application to the measurement of land, building, timber, &c.; meteorology, book-keeping, and perhaps forestry might be taken up at one of these colleges, so that young gentlemen proceeding to the forest department in India might receive their preliminary training in this country instead of France or Germany. At these colleges there should be collections of the skeletons of farm animals and specimens of dried plants, and also workshops for making farm implements, to which students should have access. The observation of the modes of farming on the Continent after leaving college would still further increase the advantages derived from their training at an agricultural college in England. The expenses of a two years' course at Cirencester is about £260 if resident, and £100 if non-resident. At Glasnevin, Dublin, the sons of tenant farmers and prospective farmers are merely charged the cost of their board and lodging, and those who come up from minor agricultural institutions receive a two years' course of training free, provided they pass a satisfactory examination. In Holland, a two years' course for a boarder at an agricultural college and farm only costs about £70; that is, not much more than a quarter of the cost in this country for similar advantages. At these colleges labour and study alternate, the labour during the day and the study every morning and evening. Of course, where there is a large number of students they may be divided into batches, engaged alternately on different kinds of field and indoor work, according to the season of the year and the exigencies of the case. The director or superintendent have a systematic programme of work mapped out for each student previously, so that every one will fall into his proper place at the proper time. An excellent training is given to each student in punctuality, order, obedience, industry, and docility in the acquirement of knowledge that is of great service to prospective farmers in after life. I shall not now dilate on the advantages of the several sciences as applied to agriculture. Suffice it to say that the sciences are the handmaid of agriculture, and confer upon the farmer who understands them, theoretically and practically, a magic wand by which he is enabled to increase the fertility of his land, to breed first-class animals, to fatten stock most economically, to keep his stock healthy, and to cure them if they are attacked by disease, and to analyze the soil, manures, or cake. In fact, the farmer of the future will be able to superintend and attend personally to all the wants and exigencies of his farm without the services of the chemist, the veterinary surgeon, or the surveyor. When the present farmers were young men, the sciences that are now announced as all-important were unknown to them. We need not, therefore, be surprised that they do not at once adopt all the latest improvements in the culture of the soil, the feeding, treating, and breeding of animals. Besides, the interests of many tenant farmers are only commensurate with the remainder of a lease, and they do not care about effecting improvements that would tend to increase the rent of their land, or not certain to repay them before the lease had expired.

However, it is to be hoped that English farmers will in future enjoy such a security of tenure while paying a moderate rent that is not to be indefinitely increased as improvements are effected, that will enable them to consider the land as their own while they perform all the lawful duties of their position. Could the tenant farmers but consider the land as their own, a wonderful improvement would be effected upon it in a few years. Then farmers would not hesitate to introduce all the latest improvements in the working of their farms, and they would take care that their successors received the best agricultural education and training this or any other country could afford. Agricultural colleges and farms would multiply, and almost every holding would become a model for admiration and imitation. Agricultural depression would cease, for the educated farmer would thoroughly understand the nature of his land so as to make it yield the largest profit, whether in milk, meat, grain, or other produce, or any two or more of these combined. The wealth of the country would be increased, and other industries, by following in the wake of agriculture, by fostering technical culture, would still further add to the resources of the country, so that the mutual revival of agriculture and trade would make us all happier by a general improvement in our present hard circumstances, and England would take another stride forward.



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ENGLISH PASTIMES.

THE HUNTING PACKS OF ENGLAND, SCOTLAND, AND IRELAND.

[Corrected from the *Field.*]

STAGHOUNDS.

ENGLAND.

Name of Hunt.	Master.	Kennels.
Her Majesty's	Earl of Hardwicke	Ascot Heath, Berks
Baynard's	T. L. Thurlow	Baynard's Park, Horsham, Sussex
Berkhamstead	R. Rawle	Great Berkhamstead, Herts
Colline Dale	G. Nurse	Colline Dale, The Hyde, Hendon
Devon and Somerset	M. F. Bisset	Exford. Minehead, Somerset
Mid Kent	C. F. Leney	Wateringbury, near Maidstone, Kent
Norfolk and Suffolk	R. A. Barkley	Palgrave Priory, Diss.
Petre's, Hon. H.	Hon. H. Petre	Chelmsford, Essex
Rothschild's, Sir N. de	Sir N. de Rothschild	Ascott, Leighton Buzzard
Surrey	T. Nichalls	Lingfield, Surrey
Watson's, Mr F	W. F. Watson	Henfold, near Dorking, Surrey
Wolverton's, Lord	Lord Wolverton	Severne Minster, Blandford

IRELAND.

Lissagoan	A. E. Humphrys	Lissagoan House, Co. Cavan
Limerick	J. Gubbins	Bruree House, Co. Limerick
Roscommon	Capt. M. J. Balfe	South Park, Castlerea, Co. Roscommon
Ward Union	A Committee	Ashbourne, Co. Meath

FOXHOUNDS.

ENGLAND.

Albrighton	T. F. Boughey	Whiston Cross, Salop
Atherstone	W. E. Oakeley	Witherley, Warwickshire
Badsworth	C. B. E. Wright	Badsworth, nr Pontefract, Yorkshire
Beaufort	Duke of Beaufort	Badminton, Wilts
Bedale	Major Dent	The Leases, Bedale, Yorkshire
Belvoir	Duke of Rutland	Belvoir Castle, Lincolnshire
Berkeley	Lord Fitzhardinge	Berkeley Castle, Gloucestershire
Berkeley, Old	A. H. Longman	Shendish, Hemel-Hempstead, Herts
Berkshire, Old	Earl of Craven	New House, Abingdon, Berks
Berks, South	J. Hargreaves	World's End, Reading, Berks
Bicester & Warden Hill	Viscount Valentia	Stratton Audley, Bicester, Oxon
Bilsdale	N. Spink	Bilsdale, Yorkshire
Blackmoor Vale	Sir R. Glyn, Bart.	Charlton, Horethorne, Dorset
Blankney	H. Chaplin, M.P	Blankney, Lincolnshire
Blencathea	J. Crosier	The Ridings, nr Keswick, Cumberland
Border	— Robson, — Dodd	Birness, Otterburn
Braes of Derwent	Lt.-Col. J. A. Cowen	Coalburns, near Ryton-on-Tyne
Bramham Moor	G. L. Fox	Bramham Park, Yorkshire
Brocklesby	Earl of Yarborough	Brocklesby Park, Ulceby, Lincolnshire
Burstow	H. Kelsey	Smallfields, Burstow, Surrey
Burton	F. J. S. Foljambe, M.P.	Reepham, Lincoln
Cambridgeshire	C. S. Lindsell	Caxton, near Cambs
Cattistock	J. Codrington	Sydling, Dorchester
Cheshire, North	Capt. E. Park-Yates	Forest Kennels, Northwich
Cheshire, South	H. R. Corbet	Adderley, Market Drayton

Chiddingfold	C. B. Godman	Park Hatch, Godalming
Cleveland	J. P. Yearly	Coatham, Yorkshire
Combe's, Mr R. H.	R. H. Combe	Frensham, Surrey
Cornwall, North	C. F. Pollard	St Breward, Bodmin, North Cornwall
Coryton's, Mr W	W. Coryton	Pentillie Castle, East Cornwall
Cotswold	A. H. Sumner	Cotswold, Cheltenham
Cotswold, North	A. Rushout	Broadway, Worcestershire
Cottesmore	Lord Carrington	Barleythorpe, Oakham, Rutland
Coventry's, Earl of	Earl of Coventry	Croome, Severn Stoke, Worcester
Craven	E. R. Wemyss	Walcot, Berks
Crawley and Horsham	Lieut.-Col. Calvert	West Grinstead, Horsham, Sussex
Cumberland	Sir W. Lawson, M.P. H. C. Howard	Roe Hill, Raughton Head, Carlisle
Cunard's, Sir B.	Sir B. Cunard	Medbourne, Leicester
Dartmoor	Admiral G. Parker	Woodlands, Ivybridge, South Devon
Devon, South	A. F. Ross	Ambrook, Totnes
Dorset, South	C. J. Radclyffe	Hyde, near Wareham, Dorset
Dulverton	J. F. Bellew	Rhyll, East Anstey, Somerset
Durham, North	A. L. Maynard	Newton Hall, Durham
Durham, South	Sir W. Eden, Bt.	Rushyford, Ferry Hill, Durham
Eskdale	A Committee	Ruswarp, Yorkshire
Essex	A Committee	Harlow, Essex
Essex, East	Lt.-Col. J. Sharpe	Braintree, Essex
Essex Union	W. H. White	Great Burstead, Billericay, Essex
Essex and Suffolk	C. B. Chaston	Stratford St Mary, Colchester
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Fitzwilliam's, Earl	Earl Fitzwilliam	Wentworth, Yorkshire
Fitzwilliam, The	Marquis of Huntly	Milton, near Peterborough
Flint and Denbigh	H. R. Hughes, Major C. R. Conwy	Kinmel Park, Abergele, North Wales
Four Borrow	G. Williams	Truro, Cornwall
Garth's, Mr	T. C. Garth	Haines Hill, Twyford, Berks
Glamorganshire	J. S. Gibbon	Llandough, near Cowbridge
Grafton's, Duke of	Duke of Grafton	Wakefield Lawn, Bucks
Grove	Visc. Galway, M.P.	Grove, near Retford, Nottinghamshire
Haldon	Sir J. Duntze, Sir L. Palk	Haldon House, near Exeter
H. H. (Hampshire)	H. W. Deacon	Ropley, Alresford, Hants
Hambledon	W. Long	Droxford, Bishop's Waltham, Hants
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Herefordshire, North	Col. Heywood	White Cross, Hereford
Herefordshire, South	J. Ranken	Bryngwyn, near Hereford.
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Heythrop	A. Brassey	Chipping Norton, Oxfordshire
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Hursley	A Committee	Pitt, near Winchester, Hants
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Kent, West	Hon. R. Nevill	Wrotham Heath, near Sevenoaks
Lamerton	G. Loob	Haine, Lew Down, Devon
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Ludlow	C. W. Wicksted	Onibury, Craven Arms, Salop
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Portsmouth's, Earl of	Earl of Portsmouth	Eggesford, North Devon
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Pytchley, North	Earl Spencer	Brigstocke, Thrapstone, N'rth'mpton
Quorn	J. Coupland	Quorn, Leicestershire
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Radnorshire and West Hereford	Lt.-Col. R. H. Price	Castle Weir, Kington, Herefordshire
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Southdown	R. J. Streatfield	Ringmer, near Lewes, Sussex
Southwold	F. Crowder	Belchford, near Horncastle, Lincoln
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Staffordshire, South	Major J. M. Browne	Fosseway, near Lichfield
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Surrey Union	J. B. Hankey	Fetcham, Leatherhead, Surrey
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Tickham	W. E. Rigden	Wren's Hill, Faversham, Kent
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Fife, West	Capt. G. C. Cheape	Blair Mill, Blair Adam, Fifeshire
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Lanark & Renfrewshire	Col. C. Buchanan	Houston, Renfrewshire
Linlithgow and Stirlingshire	Major J. Wauhope	Golf Hall, Corstorphine, nr Edinburgh
North Berwickshire and East Lothian	Hon. R. B. Hamilton	Langton, Dunse, N.B.

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Curraghmore	Marquis of Waterford	Curraghmore, Co. Waterford
Duhallow	S. Bruce	Doneraile, Co. Cork
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Humble's, Sir J. N.	Sir J. N. Humble	Cloncoshraine, Dungarvon, Waterford
Kildare	W. Forbes	Jigginstown, Naas, Co. Kildare
Kilkenny	Col. F. Chaplin	Blunden Villa, Kilkenny
Limerick County	A Committee	Carass-Croom
Louth	W. de Salis Filgate	Lissrenney, Ardee, Co. Louth
Meath	J. O. Trotter	Nugentstown, Kells, Co. Meath
Ormond and King's Co.	Earl of Huntingdon	Sharavogue, Roscrea, King's Co.
Queen's County	R. H. Stubber	Moyne House, Durrow, Abbeyleix
South Union	T. W. Knolles	Oatlands, Kinsale, Co. Cork
Tipperary	Capt. M'Naughton	Fethard, Clonmel, Co. Tipperary
United Hunt	A Committee	Midleton, Co. Cork
Westmeath	M. Chapman	Culleen, Mullingar
Wexford	D. V. Beatty	Borodale, Enniscorthy

HARRIERS.

ENGLAND.

Name of Hunt.	Height, and Breed.	Master.	Kennels.
Adam's, Capt. W H.	20 in.—H. & F. cross	Capt. W. H. Adams	Carno, Montgomeryshire
Airdale	20. in. —Foxhounds...	A Committee	Eldwick, Bingley, Yorkshire
Anglesea	21 in.—Harriers	Capt. G. P. Rayner...	Llangefni, Anglesea
Ashton	22 in.—Southern	T. A. Harrison	Thomson Cross, Lancashire
Aspull	22 in.—Southern	Mr Gerard	Aspull House, Wigan
Aston		Sir T. C. Constable	Aston Hall, N. Ferriby Brough, Yor
Auckland	18 in.—pure Harriers	R. Bowser	Bishop Auckland, Co. Durham
Barlow	22 to 23 in—Hlf-brd F	W. Vickers	Barlow, Derbyshire
Barnstaple	20 in.—H and F cross	J. H. Wagner	Pill, Barnstaple, Devon
Berkshire Vale	18 to 19 in.—Harriers	C. D. Everett	Besselsleigh, near Abingdon, Berks
Biggleswade	19 in.	G. Race	Road Farm, Bedfordshire
Bonghey's, Sir Thomas	Harriers	Sir T. Boughey, Bart.	Aqualate, Newport, Shropshire
Boxley	20 in.—Southern cross	Major M. G. Best ...	Detling, Maidstone. Kent
Bradford and Airedale	20 in.—Foxhounds ...	A Committee	Eldwick, near Bingley, Yorkshire
Brampton	19 in.—pure Harriers	R. Modlen	Sand Hill, Brampton, Cumberland
Breconshire	18 in.—Harriers	R. Williams	Brecon, South Wales
Brighton	20 in.—Foxhounds ...	W. J. Dewè	Brighton, Sussex
Brookside	21 in.—pure Harriers	S. Beard	Rottingdean, near Brighton
Buxton and Peak Forest	22 in.—Harriers	R. Bennett, M.D	Chapel-en-le-Frith
Bwlchbychan	17½ in. - H & F cross	J. P. Vaughan Pryse	Bwlchbychen, Llangbyther, S. Wales
Carnarvon	18 in.—Harriers	W. Hayward	Pen Bryn, Carnarvon
Cleobury-Mortimer	18½ in.—Harriers ...	H. V. Backhouse	Broomgr'n, Cleobury-Mortimer, Salop
Cotley	20 in.—H. & F. cross	T. P. Eames	Cotley, near Chard, Somerset
Cotswold	19 in.—H. & F. c.	Sir F. C. Ford	The Moat, Uckington, nr. Chester
Craven	22 in.—Foxhounds ...	Gapt, Henderson	Holme Bridge, Yorkshire
Dart Vale	19 in.—old Southern	J. Michelmore	Staverton, Totnes, Devon
Davey's, Mr J. S.	16 in.—pure Harriers	J. S. Davey	Bochym, Helston, Cornwall
Dove Valley	20½ in.—dwarf Fox	F. Cotton	Mayfield, Ashbourne, Derbyshire
Dykesfield	Harriers	M. Hodgson	Dykesfield, Burghley, Sands Castleban
Eastbourne	20½ in.—H. & F. cross	Vacant	Old Eastbourne, Sussex
Easton Park	20 in.	Duke of Hamilton ...	Easton, Wickham Market
Epping Forest	20 in.—dwarf Fox ...	H. Vigne	Woodford, Essex
Flintshire	21 in.—Harriers	T. W. Eyton	Llay Villa, Gresford, Wrexham
Folkestone	19 in.—Harriers	A Committee	Broadmead, Folkestone
Gibbon's, Mr J. S.	18 in.—Harriers	J. S. Gibbons	The Leasowes, Worcestershire
Gunton	18 to 20 in.—Harriers	Lord Suffield	Gunton Park, Norwich, Norfolk
Harvey's, Sir R. B. ...	19 in.—Harriers	Sir R. B. Harvey, M.P.	Langley Park, Slough, Bucks
H. P. H.	19 in.—F. & H. cross	J. W. Chesshyre	Hertford Heath
Hicks', Mr E.	17 in.—Harriers	E. Hicks	Great Wilbraham, Cambridgeshire
High Peak	20 in.—dwarf Fox ...	R. W. M. Nesfield ...	Castle Hill, Derbyrhire
Holcombe	22 in.—Lancashire ...	A. Ashworth	Holcombe, Ramsbottom
Holme Valley	22 in.—Harriers	A Committee	Honley, near Huddersfield, Yorkshire
Hundred of Hoo	19 in.—Harriers	P. Hilton	Hoo Common, Kent
Kingsnorth	21 in.—S. & F. cross	W. G. Hancock and J. A. Buckland	Kingsnorth, near Ashford
Leighton	18 in.—Harriers	R. L. H. Phipps	Leighton, Westbury. Wilts
Longdon	16½ in.—H. & B.	T. V. Foster	Longdon Lodge, Rugeley, Staffs.
Long Sutton	19 in.—cross-bred & H	G. T. Peele	Long Sutton, Lincolnshire
Lowther	21 in.—Harriers	Earl of Lonsdale, J. Barker, deputy	Lowther New Town, near Penrith
Lyme	20 in. to 22. in—H....	W. C. Brocklehurst...	Disley, Cheshire
Marlborough	20 in.—Harriers & F.	J. S. Hurrell	Marlborough, nr Kingsbridge, Devon
Marshall's, Mr W. C....	19½ in.—H. & Fox...	W. N. C. Marshall ...	Hendergrove, St Clear, Cornwall
Mills, Mr	18½ in.—pure H.	Mr Mills	Bisterne, Ringwood, Hants
Modbury	18 in.—Harriers	G. May	Modbury, Ivy Bridge, Devon
Nant-Eos	12 in.—cross bred ...	Major Phelp	Sunnyhill, Tregaron R.S.O.
Nepicar		E. W. G. Bailey	Nepicar House, Wrotham
North Tyne	18¾ in.—	Col. J. C. Anderson	Simonburn, Humshaugh-on-Tyne
Oldham	22 in.—Harriers	S. Mayall	Chadderton, near Manchester
Overton	20 in.—Foxhounds ...	F. Arkwright, M.P...	Overton Hall, Derbyshire
Oxenholme		C. W. Wilson	High Park, Kendal
Pembroke's, Earl of	19 in.—Harriers	Earl of Pembroke	Wilton Park, near Salisbury
Pendle Forest	21 in.—H. & F. cross	Lt.-Col. Le G. Starkie	Huntroyde, Burnley, Lancashire
Penistone	22 to 23 in.—old S....	H. Tomasson	Plumpton, Yorkshire
Plas Machynlleth	19 in.—Harriers	Marq. of Londonderry	Plas Machynlleth, Montgomeryshire
Q. R.	18 in.—Harriers	W, Chorley	Quorn, Dunster, Somerset
Ray's, Mr F. H.	22 in.—pure F bitches	F. H. Ray	Finghall, Bedale, Yorkshire
Ripley and Knap Hill	21 in.—Foxhounds ...	C. P. Shrubb	Worplesden, Surrey
Roath Court	20 in.—Foxhounds ...	C. H. Williams	Roath Court, Cardiff
Rockwood	20 in.—H. & F. cross	W. Norton	Rockwood, Denby Dale, Huddersfield

Name of Hunt.	Height, and Breed.	Master.	Kennels.
Romney Marsh	20 in.—Foxhounds	W. D. Walker	Honeychild Manor, Kent
Ross	Harriers & Foxhounds	Lt.-Col. Harrison	New Inn, Hentland, nr Ross, Hereford
Rossendale	20 in.—pure Harriers	Messrs Brooks, Hall, and Hardman	Rossendale, near Manchester
Saddleworth	21 to 24 in.—F & H c	J. H. Lees	Trencher-fed
Scotchwell	16 to 19 in.—Harriers	Admiral J. L. Stokes	Scotchwell, near Haverfordwest
Seavington	20 in.—mostly pure H	C. Langdon	Lopenhead, Ilminster, Somerset
Severn Vale	18 to 20 in.—Harriers	Capt. C. A. Delmar	The Henfaes. Welshpool, Mont.
Shotesham	18 in.—pure Harriers	R. Fellowes	Shotesham Park, Norwich
Silverton	20 in.—Harriers	T. Webber	Ford, Silverton, Devon
South Pool	19 in.—Harriers	A. F. Hallifax	South Pool, near Kingsbridge, Devon
Stannington	21 to 23 in.—mostly heavy Harriers	C. B. Speight	Millhouses, near Sheffield
Tanat-side	18 in.—modern H.	H. G. Lloyd	Felton Grange, W. Felton, Shropshire
Taunton Vale	20 in.—pure Harriers	A Committee	Blackbrook, Taunton
Teesdale	18 in.—Harriers	K. Hutchinson	Egglestone Hall, Darlington
Thanet	20 in.—Harriers	H. S. Russell, W. P. Coster	Brooksend, Thanet, near Margate
Todmorden	21 in.—Harriers	J. Greenwood	Holme, Stansfield, Todmorden, Yorks.
Torquay	19 in.—Harriers	W. R. Gee	Shiphay, Collaton, near Torquay
Trafford	18 & 20 in.—pure H.	Sir H. de Trafford	Trafford Park, Manchester
Treffry's, Mr C. E.	20 in.—Harriers	C. E. Treffry	Fowey. Cornwall
V. C. H.	19 in.—cross bred	Major Birch	Maes Elwy, St Asaph
Vale of Lune	Harriers & cross bred	T. G. Edmondson	Low Bentham, Lancashire
Waveney	20 in.—H. and Fox	C. Chaston	Mendham, Harleslon, Norfolk
Wells' Subscription	18 to 20 in.—pure H.	Capt. J. W. Yeeles	Coxley, Wells, Somerset
West Street	20 to 21 in.—Fox	Earl Granville, M. B. Thompson, deputy	Cold Blow, near Walmer, Kent
Whitby	18 in.—Harriers	E. W. Chapman	Poplar Row, Whitby, Yorkshire
Whitehaven	18 to 20 in.—pure H.	H. Jefferson	Mirehouse, Whitehaven, Cumberland
Winchester	16 to 17 in.—Harriers	J. Dear	Winchester, Hants
Wirral	20 in.—cross-bred	J. J. Houghton	Leighton Hall, Neston, Cheshire
Wyfold	19 in.—Harriers	E. Herman, M.P.	Wyfold Court, Henley-on-Thames

IRELAND.

Name of Hunt.	Height, and Breed.	Master.	Kennels.
Allenstown	17 in. —pure Harriers	J. M. Purdon	Cloneymore, Athboy, Co. Meath
Arravale	18 in.—cross bred	R. C. Chadwick	Ballinard, Tipperary
Ballycross	20 in.—cross bred	M. Green	Ballycross, Co. Wexford
Ballyshannon	19½ in.—Welsh H. & Foxhound cross	J. R. Dickson	Tullaghan, Co. Leitrim
Bellinter	22 in.—Fox bitches	Mr Preston	Bellinter, Navan
Blake's, Mr C. H.	20 in.—H. & F. cross	C. H. Blake	Bridge House. Tuam, Co. Galway
Brook's, Mr	19 to 20 in.—cross bd	G. Brooke	Summerton, Co. Dublin
Castle Freke	18 in.—Harriers	Lord Carbery	Castle Freke, Milltown, Clonakilty, Co. Cork
Cork	21 in.—Harriers	A Committee	The Glen, Spring Lane, Cork
Dufferin	24 in.—Foxhounds	A Committee	Comber, Co. Down
Faithlegg	20 in.—Harriers	P. Power	Faithlegg, Waterford
Fermanagh	19 in.—pure Harriers	J. P. Porter	Dunbar, Enniskillen
Glin and Tarbert	20 in.—mixed	Major Kiggell	Cahara, Glin, Co. Limerick
Gortmore	18 to 20 in.—Welsh Beagles & a few Fox	J. Sherlock	Greenane, Kanturk, Co. Cork
Gray's, Capt. R. J.	20 in.—Welsh H.	Capt. R. J. Gray	Iota Ville, Cork
Greenhill	20 in.—Foxhounds	Capt. L. Dames	Greenhill, King's County
Iveagh	20 in.—cross-bred	A Committee	Kilpike, Co. Down
Kildare	21 in.—Irish Fox	T. G. Waters	Kilpatrick, Monasterevin, Co. Kildare
Killultagh	26 in.—pure Fox	H. J. McChance	Lisburn, Co. Antrim
Kilmurry	19 in.—cross-bred	F. W. Hickman	Kilimore, Knock, Co. Clare
Kinsale	16 in.—Harriers	R. Gillman	Sandy Cove, Co. Cork
Lecale	21 in.—Foxhounds	Col. Forde	Seaforde, Co. Down
Mallow	19 in.—dwarf Fox	J. A. R. Newman	Dromore House, Mallow
Mayo, South		W. Dove	Clonboy, Claremorris, Co. Mayo
Monaghan	24 in.—Harriers	Lord Rossmore	Brandrum, Monaghan
Newbridge	22 in.—dwarf Fox	Col. Hon. W. Forbes	Newbridge, Co. Kildare
Newry	19 in.—Harriers	T. D'Arcy Hoey	Dromcashlone, Co. Down
O'Hara's, Mr C. W.	22 to 23 in.—old Irish H., crossed Eng F.	C. W. O'Hara	Annaghmore, Collooney, Co. Sligo
Old Rock and Chichester	22 in.—Foxhounds	J. Owens	Fort View House, Co. Antrim
Pollok's, Mr J.	21 in.—Foxhounds	J. Pollok	Lismany, Ballinasloe, Co. Galway
Rock (Cashel)	19 to 21 in.—H & F c	M. Russell	Gort McEllis, Cashel, Co. Tipperary
Route	20 to 22 in.—Fox	J. S. Moore	Ballymagarry, Portrush, Co. Antrim
Screen	19 in.—H. and F. c.	J. Gainford	Ballyhague
Stacpoole's, Mr R.	19 in.—cross-bred	R. Stacpoole	Eden Vale, Ennis
Strabane	20 in.—pure Harriers	J. Herdman	Carricklee, Strabane, Co. Tyrone
Stronge's, Sir James	21 in.—Foxhounds	Sir J. Stronge, Bart.	Carker House, Doneraile, Co. Cork
United	20 in.—cross-bred	J. W. Evans, R. G. Annesley	Fellows Hall, Armagh
Upton	18 in.—cross-bred	J. H. Payne	Beechmount, Upton, Co. Cork

Name of Hunt.	Height, and Breed.	Master.	Kennels.
Warburton's, Mr	20 in.—cross-bred	R. Warburton	The Copse, Portarlington
Well Fort	17 in.—Harriers	M. I. D'Arcy	Well Fort, Kilkerrin, Co. Galway
Wicklow County	20 in.—H. and F. c.	A Committee	Glassnarget, Rathdrum, Wicklow
Youghal		Capt. W. Smithwich	Youghal House, Nenagh

BEAGLES.

Addie's, Mr J.	16½ in.—Beagle H.	J. Addie	Wester Moffat, Airdrie, N.B.
Bronwydd	15 in.—Beagles	Sir M. Lloyd	Bromwydd, Llandyssil, South Wales
Carmarthen	14 in.—Beagles	J. L. Philipps	Bolahaul, near Carmarthen
Chester	15½ in.—Beagle H.	J. T. Pownall	Lache Lane, Chester
Christchurch, Oxford	14½ in.—Beagles	A Committee	Garsington, near Oxford
Chute Hall	22 in.—Beagles	F. B. Chute	Chute Hall, Tralee, Co. Kerry
Cockermouth	15 in.—Beagles	Col. Green-Thompson	Wellfield, Longcroft, Cockermouth
Colchester	14 in.—pure Beagles	P. Nicholl	East Hill, Colchester
Gosport and Fareham	15 in.—Beagle H	R. Binstead	Peel Farm, Fareham, Hants
Hazlerigg's, Major A.	14½ in.—pure Beagles	Major Hazlerigg	The Barracks, Ayr
Jackson's, Mr E.	14½ in.—pure B	E. Jackson	Ashingdon, Rochford, Essex
Jenner's, Mr	15½ in.—Beagles	B. St A. Jenner	Bryntirion,, Bridgend, Glamorgan
Knighton	18 in.—Harriers	T. Bowles	Lower Stanage, Salop
Lawrenny	13 in.	F. L. Phillips	Lawrenny Park, Pembroke
Nutfield	14 in.	W. F. Felton	Holmesdale, Nutfield, Surrey
Royal Rock	14½ in,—pure B	Lt.-Col. V. A. King	Rock Ferry, Birkenhead, Cheshire
Sadberge Hall	16 in.—Harriers	W. A. Wooler	Sadberge Hall, Darlington
Thirty-second Light Infantry	13 to 15 in.—Beagles	Capt. Alexander	Scraesden Fort, Devonport
Trinity College, Camb.	15¼ in.—Beagles	C. A. Tennant	Merton Arms, Cambridge
Warwickshire, North	14½ in.—pure B	H. Graham	Olton, Solihull, Warwickshire

NOTE-BOOK RULES OF GAMES.

WHIST.

TO the person wishful of playing a game, there are three courses open. He may play a game entirely dependent on skill, and he will probably rise from the table unrefreshed, if not with a headache; he may indulge in a game exclusively of chance, and finish either with a feeling of having robbed his friend, or, more likely, lost himself more money than he can well afford; or he may amuse himself with a game combining both chance and skill, in which a moderate experience will suffice to make a fair player, and a moderate stake prove enough to give zest to play. Chess and Hazard may be said to have held divided popularity from classical times down to the period when Whist sprang, from the humble beginning of the ale house, ruff and honours, into the proud position of England's in-door game.

Whist, as now played, is a game for four persons, with one complete pack of cards. The four players divide into two parties, each player, sitting opposite his partner, who has been chosen by cutting the cards, the two highest playing against the two lowest. The holder of the lowest card is the dealer, and he sends out the cards one by one, beginning with his left-hand opponent; the last, or trump card, turned face upward at the end of the deal, remains on the table till the first trick is won, and turned. Each player, having sorted his cards by suits, the dealers' left-hand opponent leads, each player must follow suit if he can. The highest card of the suit led wins the trick, unless a player, being without one of that suit, exercises his option of playing a trump—that is, a card of the same suit as the turned-up card. The winner of the trick then leads off a card, the other players follow in their due order, and so the game proceeds till the game is played. Each trick after the suit is a point, and successive hands must be played till one side have five points in Short Whist, or ten points in Long Whist. Besides, by tricks, points are scored by *honours*, by which name the four court cards of the trump suit are known. The partners holding all the honours score four points, holding three they score two; where each set of partners hold two, nothing is scored.

At one point before *game*, honours do not count.

The following are additional rules of importance:—

SHORT WHIST.

1. The game consisting of five points, one point scored saves the triple game; three points save a double.

2. An exposed card necessitates a fresh deal.

3. In cases of mis-deal, the deal passes to next player.

4. No player but he who made the last trick has a right to look at it after it has been turned.

5. If a suit is led, and any of the players, having a card of the same suit, shall play another suit to it, and the trick be turned, a *revoke* occurs, for which the penalty to the party making it is the forfeiture of three tricks.

6. A player may ask his partner "What are trumps?" but may ask no further question as to the cards.

7. When you want your partner to lead trumps, throw away a higher card before a lower.

So far for the rules of Whist. To play well requires much observation and constant play; to play fairly, a careful regard of the following brief maxims may suffice:—

1. Lead from your most numerous suit.

2. If holding three court cards of a suit, lead the lowest of them; if holding less, lead the lowest card of the suit.

3. Lead your own suit before you return your partners', unless he leads trumps, which return directly.

4. In returning your partners' suit, if you have only two left, return the highest; if more, the lowest; but in any position, if you hold the best card, play it the second round.

5. Holding five trumps, lead them or call for them. If your partner calls, lead the highest of three or less, the lowest of four or more.

6. Second hand play your lowest; third hand play your highest.

7. Do not trump for doubtful tricks. Second, unless you are poor in trumps, when do so, fearlessly.

8. Discard from your weakest suit.

9. Where you have a sequence of cards, play the lowest.

10. In a suit where you hold ace and queen, refrain, if possible, from leading that suit.

BILLIARDS.

THE game of Billiards comes to us from France, where it was invented about the fourteenth century. It became known in England in the time of the early Tudors, and was well established by the reign of Queen Elizabeth. It is played with ivory balls about 2 inches in diameter, and with long tapering wooden cues, upon a table twice as long as it is broad. Full size is a 12-foot length, but 10 feet allows very fair play, and the common French board, without pockets, is only about 8 feet long. A good table should have a slate bed, fine green broadcloth for board, and vulcanized india-rubber cushions. The Billiard table proper has six pockets—one at each angle and one in the middle of each longer side. The object of the players is to force the balls into one or other of the pockets, or to make canons by striking both the object balls with the players' own ball. Every table has three spots, and a baulk line 2½ feet from the lower end. On this line is inscribed a semicircle, technically called the striking point. The first spot is placed about 11 inches from the top of the table, and is known as "the" spot. The second is nearer to the centre, being 2½ feet from the top; and the third occupies the centre of the table. The red ball is placed on one of the spots, usually on the first, and the player commences by striking his ball out of the semicircle. He should choose a cue about the length to stand well under his chin. For canons, he should grasp the cue rather loosely between the fingers and thumb. For hazards—the feat of driving a ball into a pocket—he should hold the cue accordingly as his aim is a winning hazard—to drive with his ball another ball into a pocket; or a losing hazard—to put his own ball in a pocket off another ball. In this latter case he should hold the cue as for a canon; in the former, more firmly. Whenever he pockets his own ball, his next play is from baulk. The entire game of Billiards consists in playing the ball at such an angle as to make canons or hazards; and it is therefore most important to remember that the angle of reflection is equal to the angle of incidence. As to the position of the cue: For a full *centre stroke*, the ball must be struck well in the centre with a sharp blow; for a *twist* it must be struck below the centre with a sudden backward jerk. To make the ball *jump*, it must be struck sharply on the top with a downward-forward blow. For a *following stroke*, the cue must be pointed high, and the ball struck considerably above its centre with a pushing-forward motion. The higher it is struck the faster does it travel; the lower it is struck the more slowly does it move. The *side stroke* consists in striking the ball on the side on which it is intended to travel after contact with the object ball. Billiards is a game which cannot be learned from any summary of principles, and we therefore proceed at once to such rules as are not embraced in the preceding explanations:—

1. A canon counts two, also a white hazard. A red hazard—pocketing the red ball—counts three.

2. If a player makes any points by canon or hazard, he continues his game until he ceases to make points, or gives a miss. A miss counts one point to the adversary.

3. If an adversary's ball is off the table, and the two remaining balls are either upon the line or within the baulk, the player whose ball is in hand must play outside from the semi-circle; and if he fails to strike either of the balls in returning from the cushion, he loses one point for a miss.

4. A player's feet, in playing, must not be off the floor.

5. If a striker pocket the red ball, counting three, and by the same stroke pocket his own from the red, he counts three for this also.

6. Ten points is the maximum obtainable off a single stroke. They are to be obtained by striking the red ball first, making a canon, and by the same stroke pocketing the player's own and both the other balls.

7. However little a ball is moved by touch of the cue, such movement constitutes a stroke.

8. A *coup* consists in pocketing one's own without striking another ball. It counts three to the adversary.

9. If the striker's ball be in hand, he has no right to play at a cushion within the baulk in order to strike a ball that is out of it.

10. It is advisable to canon from the red to the white rather than from white to red, for this latter play favours your adversay's next stroke, while the former generally leaves your ball fairly safe.

LAWN TENNIS.

THIS fashionable out-door game, which has quite superseded croquet in the favour of society, is played on a piece of ground 27 feet in width and 78 feet in length, which is divided across the middle by a net, the ends of which are attached to the tops of two posts standing on either side, 3 feet outside the piece of ground or *court*. The height of the net is 4 feet 9 inches at the posts, and 3 feet at the centre. At each end of the court, and parallel with the net, are drawn the *base-lines*, the extremities of which are connected by *side-lines* at right angles to the net. Half-way between the side-lines and parallel with them is drawn the *half court-line*, which divides the space of each side of the net into two equal *right hand* and *left hand* courts. On each side of the net, at a distance of 22 feet and parallel with it, are drawn the *service* lines. If the ground at command is limited, the proportions may be 56 feet by 27 feet, and the service line is then 16 feet from the net.

The game is played with racquet bats and balls, the said balls being not over 2⅝ inches in diameter, or 2 ounces in weight.

THE RULES OF THE GAME.

1. Players toss for sides. The winner of the toss decides either to commence—*i.e.*, *to serve*, or else to choose his side of the net. If he does the former, the opponent, or *striker-out*, chooses the side of the net and *vice versa*.

2. At the end of each game, striker-out and server change *roles*.

3. The server stands with one foot outside the base-line, delivering the service—*i.e.*, playing the ball from the right and left courts alternately, beginning with the right.

4. The ball served must drop within the service line, half-court line, and side line of the court, which is *diagonally* opposite to that from which it was served, or upon any such line. The service, therefore, is something like the *Knight's move* in Chess.

5. The infraction of Rule 4 is a *fault*. After a fault, the server plays again from the same court from which he served the fault, but if he plays two consecutive faults, his adversary scores a *stroke*.

6. The service may not be *volleyed*—*i.e.*, taken *before* it touches the ground.

7. The server wins a stroke under the following circumstances:—(*a*) If the striker-out volley the service; (*b*) if he fail to return the service before the ball strikes the ground a second time; (*c*) if he return the service so that the ball drops outside the server's court; (*d*) if the ball strike the adversary; (*e*) if the adversary—the striker-out—strike the ball more than once.

8. It is a good service or return although the ball, in passing over, strike the net.

9. The striker-out wins a stroke—(*a*) under Rule 5; (*b*) if the server fail to duly return the ball returned to him; (*c*) if the server allow the ball to strike him; (*a*) if the server strike the ball more than once.

10. On either player winning his first stroke, the score is called 15 for that player; 30 on winning his second stroke, and 40 on his third stroke, and the fourth stroke is *game;* and six games make a *set*, except as by Rules 11 and 12 provided.

11. Both players having won three strokes, the score is called *deuce;* and the next stroke won by either player is scored *advantage* for that player. If the *same* player win the next stroke, it is *game*, but if his opponent score, it is called again *deuce*, and so on until either player win the two strokes immediately following the score of deuce, when the *game* is scored for that player.

12. If both players win five *games*, the score is called *games-all;* and the next game won by either player is scored *advantage game* for that player. If the *same* player won the next *game*, he wins the *set;* if his adversary gain it, the score is once more called *games-all;* and so on until either player win the two *consecutive* games after *games-all*. The player who so wins scores the *set*.

13. Where *four* play, instead of two, the width of the court is usually 36 feet, and the net is raised 1 foot in the centre. The serving pair decide which partner shall serve in the first game, and then opponents similarly decide who shall strike-out. Once having so decided, the partners must take turn and turn about each game and each set. No player may receive or return a service delivered to his partner (this restriction may be waived with second-rate players, but in such a case an arrangement by the partners, preventing their getting into each other's way, is very necessary).

14. Odds being very commonly granted, the following *bye-laws* have been made for their regulation:—

I. A *bisque* is one stroke which may be claimed by the receiver of the odds at any time during the set, except (*a*) a bisque may not be taken after the service has been delivered; (*b*) a server may not take a bisque after a fault, but the striker-out may do so.

II. One or more bisques may be given in augmentation or diminution of odds.

III. *Fifteen*, is one stroke given at the beginning of every game of a set; *half-fifteen*, one given at the beginning of every alternate game.

IV. *Thirty*, is two strokes given at the beginning of every game of a set; *half-thirty*, is two and one strokes respectively given at the beginning of every alternate game.

V. *Forty*, is three strokes given at the beginning of every game of a set; *half-forty*, is three and two strokes respectively given at the beginning of every alternate game.

VI. The giver of the odds may agree to lose a stroke on not returning the ball to any particular courts of his adversary.

CHESS.

THE game of Chess is played by two persons on a chequered board of sixty-four squares. Each player has sixteen pieces of opposite colours, and the board for playing is placed with a white square in the right-hand corner. The pieces are technically subdivided into *pieces* and pawns. The pieces are ranged on the "home" line of each player, and each piece has a pawn on the square in front of it. The pieces at the extreme right and left are figured as Castles, and are technically known as Rooks, from a Persian word signifying fortress. Next to the Rooks stand two Knights, next the Knights two Bishops. In the middle is the Queen on the square of her own colour, and the King on the remaining square.

The KING moves one square at a time in any direction. He never leaves the board, and he cannot move on the next square to the opposing monarch. The King is never taken; when attack can neither be avoided by retreat or repulsed by capture of the assailing piece, the game is over, and there is a *checkmate.*

The QUEEN moves *in lines* in all directions diagonally, or at right angles, but she cannot jump another piece.

The ROOKS move in rectangular lines only. They cannot jump another piece.

The BISHOPS move in diagonal lines only. They cannot jump another piece.

The KNIGHT moves one square diagonally and then another square forward. Thus, if he occupies a black square, he will rest on one of the opposite colour. He can leap another piece or pawn, and by a series of oblique moves can attack and occupy every square on the board.

The PAWNS move straight forward one place at a time, except at the beginning of a game, when they have the privilege of moving two squares. They capture the enemy *diagonally.* They never retreat like the pieces, but if they reach the enemy's "home" line, they may be exchanged for any piece their owner pleases. The Queen is worth a Rook and a Bishop, but not worth quite two Rooks. The Knight's exact value is hardly ascertainable, but may be reckoned worth as much as a Bishop so long as the two are preserved. Rooks and Knights can support each other, Bishops cannot. A King and Rook, a King and two Bishops, and a King, Knight, and Bishop can win against a King, but two Knights cannot win against a King.

CHECK is the term applied to an attack upon the King. The King so attacked must either retreat or take the enemy. If he cannot reach or take the enemy, one of his supporting pieces must do so or interpose. The attack of the Knight admitting of no interposition, he is of great service "in the thick of the fight;" when none of the above courses can be pursued, the game is lost to the checked King. Check may arise from a move which uncovers an attacking piece, and as this uncovering move may be itself to attack the King, it is therefore possible to have a double check.

STALEMATE is where the King cannot move without going into Check. This is a drawn game, as the more powerful side should always be able to prevent the weaker side taking up what is virtually an impregnable position.

A DRAWN GAME results from both sides being equally reduced to only Kings or Knights, or only Kings and a single Bishop each. Wherever Checkmate is not to be effected, the game is drawn. Where one side is reduced to King only, or to King and one piece only against superior forces, he may call on his opponent to checkmate in *fifty* moves. This the opponent must do, or the game will be *drawn.*

CASTLING.—Once in every game the King may *Castle*—a move performed thus: If the space between the King and Rook be unoccupied, the King moves two squares to the right or left, and the Rook is brought to the square on the side of the King furthest from the corner from which it was moved. The player cannot castle if either King or Rook have been moved, if the King has to pass over or on to a square commanded by the adversary, or if the King be at the moment in check. Castling has for its object to bring the Rook into the open, and to shelter the King.

EN PASSANT.—When a Pawn has advanced to the fifth square, and the opposite player pushes a Pawn two squares forward as his first move, the other Pawn has the right to capture him, and move on to the square where he would have stood had he moved one place only. This capture is not obligatory.

GAMBIT.—This is the sacrifice of a piece or Pawn in order to gain at the beginning of the game a commanding position. Young players must be very careful not to take a Knight or Pawn temptingly offered at the early part of a game. If they *do* take it, they will find themselves in an embarrassed position within a few moves.

Checkmate is the one aim of a game of Chess, and therefore the opposing King should be attacked with as rapid a concentration of forces as possible. It is advisable to Castle early, for a Castled King needs only his Rook and a Knight to protect him against very formidable hostile combinations. Thus a preponderating force is left free to attack the hostile King. Late in the game Castling is generally a wasted, sometimes even a very dangerous move.

The *King* should be moved as little as possible. A wandering King may meet with most ignominious cheekmate. If let alone on the board, he should manœuvre so as to keep on the central squares if he is left with pieces only against him. If Pawns oppose him, he must keep in their front, and do his best to prevent their being Queened—that is, exchanged for a Queen, or other powerful piece, on reaching the "home" line of the opposing player.

The *Queen* is the most useful and the most powerful of pieces. She should never be parted with for less than two Rooks. The Queen and Rook are, from their normal position, liable to be 'forked" by an opposing Knight, whose peculiar powers enable him to assail more than one piece at a time. Where King and another piece are so "forked," the King has to be moved, and the other piece must needs fall to the Knight. Beginnings are more usually routed by this insidious assault than by any other piece of strategy. *Cave equitem.*

The *Rook* is worth more than a Bishop, but may be profitably lost in order to take a Bishop *and* a Knight. Two Rooks doubled are very strong, and the player who manages to establish his Rook on the foe's "home" line is seldom the loser of the game. Rooks should not be brought out during the first dozen moves. They form, indeed, the veteran reserve of the old Roman legion.

The *Bishop* should be early advanced. Two Bishops side by side are very powerful, and greatly impede the adversary's movements. They require protection from Pawns or a Rook.

The *Knight* should always be found where the foe is thickest. His attack is often terribly destructive where a player, on the defensive, has gathered his forces in compact power round his King. The two Knights, supporting each other, are powerful and dangerous. Knights and Bishops begin the game usually.

Pawns should be rapidly advanced in mutually protective diagonal lines. A line of four, with a Bishop at the end, often compel the enemy to make great sacrifices in order to shatter it. Never, as a rule, allow the enemy to sweep off your Pawns while you are prosecuting some particular plan. Postpone your plan, for unless you see the way to the enemy's checkmate *very clearly*, you will almost invariably find the sacrifice has been too heavy. Pawns at the end of the game, backed by a single piece, are often a match for two or three pieces unaided by Pawns. When a Pawn has reached the seventh line, any sacrifice short of a Queen must be made to stop the Queening of such Pawn.

Chess must be played by a beginner against *odds*. He should first take a *Queen* and then a *Rook;* when he can beat his opponent with these odds he will find the difference between them not more than a *Knight* or a *Pawn and move* will balance; and from this moderate inferiority he will soon advance to an equal position. The great secret of success in Chess is to play boldly yourself, while making, before every move, a general cautious survey of your enemy's attack on you. Two attacks, in each of which the balance of pieces is to you, will nearly always give you the upper hand; and it is precisely in exchanges and engagements where, while both sides suffer, you inflict greater losses on your opponent than he on you, that skill is evolved, and the most animated play exhibited.

VINGT-UN.

IF Commerce, Speculation, and Pope Joan were the round games of the past, and if Euchre and Poker are destined to be the round games of the future, Vingt-un is, at all events, *the* round game of the present. Its popularity, too, is well deserved, for it affords, and in right proportion, all the elements needed for a good round game. There is more chance than in Whist, yet shrewd judgment and a cool head will usually obtain their due reward in a couple of hours' play. It is an active, bright, and conversational game, and although best played when for moderate stakes, it is yet of very fair interest in those severe circles where playing for any money is reckoned and constituted an eighth deadly sin. The cardinal principle of the game is to make by cards twenty-one, or to approach nearer to that number, *without exceeding it*, than your fellow players. Any number can play Vingt-un, but from five to eight are the best parties. The dealer having been found by cards being given till one player gets a knave, the happy winner of the deal proceeds to give a card, face downwards, to each player, who, looking at it privately, stakes according to its chance. Now, supposing the card to be an ace, which counts one or eleven at option, and which with a ten or court card makes a "natural," it is advisable to stake the maximum upon it. If it be a ten or court card (court cards all counting ten), one may safely stake nearly the maximum. A nine is also worth a good stake. On lower cards it is not advisable to put a high stake. But to continue the course of the game. Stakes being deposited, the dealer, according to the merit of his own card, decides or not to double the stakes. He then gives, also face downwards, another card to each player. If at this stage any player have a "natural," he must declare it, and he not only receives double his stake from the dealer, but himself becomes dealer on the next round. If the dealer have a natural, each player pays him double his own stake. If, however, no naturals appear, the dealer decides from his cards whether to challenge the board or no. If he challenges, cards are all turned up, and all nearer than himself to twenty-one are paid by him the amount of their stakes, while from all ties and all farther from twenty-one he receives the stakes. If he do not challenge, he asks each player in turn whether he stands by his two cards. If he wants more, he receives them from the talon, or cards in hand; only a player getting more than twenty-one *immediately* pays his stake to the dealer. The dealer in turn may take more cards than the original two; and if he overshoots twenty-one he pays all who have under that total. If, however, he stops short of this catastrophe, then, as in the case of his challenging the board, cards are displayed, and while ties and inferior numbers pay him, he pays superior numbers. When, by addition of *three* or more cards, twenty-one exactly is obtained, the holder thereof has no more than the best chance on the comparison of hands. If the dealer have twenty-one in this manner, he yields only to a natural.

HINTS.

1. The dealer may sell his deal, and if the party be of five or six, it is worth perhaps double the fixed maximum stake. If more are playing, it is not of so large a value.

2. A dealer should generally double where stakes average low, but unless he holds an ace or ten he should not double high average stakes.

3. With cards in hand amounting to seventeen or more, it is generally advisable to stand, while as ties pay the dealer *he* may stand on sixteen.

4. Where two first cards received are of the same value, players may stake and receive in each hit. This division is not very advisable, except where the equal cards are aces.

5. A dealer and a player cannot hold a natural simultaneously. Each player looks at his second card on getting it, and if it makes, with the first card, a natural, he is entitled to payment by the dealer *at once*. He is then *out* of that round; and if the dealer have a natural when he gets his own second card, then all the players left in pay the dealer double their stakes, but he pays nothing. Players are often very careless on this point.

6. The natural does not, with six or seven players, occur on the average more often than once in five rounds; the dealer should remember this, and not allow fear of the natural to prevent him doubling. The stakes will shew the average luck of the players, and with this guide the dealer should made up his mind to double with frequency and courage.

7. If counters are bought at so much a dozen, start with plenty, for subsequent buying destroys coolness and injures play in the majority of players.

LONDON CLUBS.

THE Club is one of the most distinctive and individual of English institutions. Wherever Englishmen settle, Clubs arise and flourish; wherever Englishmen are not, Clubs are either unknown or are known only as a foreign institution which certain enthusiasists have attempted, and unsuccessfully, to naturalize. The country gentlemen of France have their Circle Agricole in the Faubourg St. Germain, but with this solitary exception, Clubs abroad seem only possible by making them something essentially different from what the English Club is. The immediate projenitors of the present London Clubs were the coffee-houses of the reign of Queen Ann; these, although nominally public, exoteric and and not exoteric institutions, were in reality the haunts of various cliques of coteries which would no more have intruded themselves on the coffee-houses of rival "sets," than they would have mixed themselves up together upon the Parliamentary benches. The Club, in the embryo state, may frequently be met with abroad, especially in provincial French towns where, at the principal *café*, it is no unusual thing to find the districts' rival coteries taking by the *lex non scripta* of a Spanish etiquette, each a particular side of the common resort. The first Club, properly so called, which opened its doors for the *élit* of London Society, was

WHITES'.

Established in 1730, this famous old Club has preserved its vitality unimpaired through half-a-dozen generations, and has seen grow up around it a score of similar institutions, of which some have passed it in popularity and fashion, but none in high repute. Difficult to enter it has always been, as it has always been esteemed for its cellar and *cuisine*. It is in the very centre of the Club district, in fact, the other houses have sprung up round it, each endeavouring to secure ground as near as might be to the envied centre spot. "Refinement" is the motto of Whites', and though it is reckoned somewhat of an old gentleman's Club, yet it cannot be spoken of as "slow." The yearly subscription is rather high, the entrance fee comparatively moderate.

BOODLES'.

One of the oldest of the Clubs, and once decidedly fogeyish, Boodle's has recently been the subject of a metamorphosis, which has reduced the "old and crusty" element to very unimportant dimensions, and has made the house one in which young men of good family are very glad to obtain admission.

BROOKS'.

A very "close" preserve of aristocratic Whiggism, Brooks' has a fine old reputation worthy of the old mansion in which it is located. The number of members is moderate, and the satisfaction of membership, when obtained, consists in comfort of the quieter, duller, and more soothing sort. The reserved and sensitive Whig, whose nerves have been jarred by the "louder" members of the Liberal party, turns into Brooks' with a feeling of safety and relief, which arrival at no other haven can possibly bestow. Brooks' and Boodles', veterans of St James' Street, are the old rival institutions of Whig and Tory, but the fire of political passion has here burnt itself out with years.

ARTHUR'S.

Another of the old, quiet, private Clubs in St James' Street. Rather dull perhaps, but much liked by the old and middle-aged gentlemen who meet there for mild whist, milder gossip, and mildest drinks in the form of the barley-water, for which the Club has always had a special reputation.

THE CARLTON.

If the Whigs have owed much of their influence and success to their great ladies, their receptions and their "at homes," the Tories owe as much, if no more, to their "Associations" and their Clubs. All the Conservative Clubs are successes, all bear a high reputation, all realize their purpose in an admirable manner. Fortune has favoured nearly all of them with singularly "diplomatic" committees, and the only complaint that can be made is that one or two of them are overcowded. Of the handsome building which dwarfs on the east of the War Office in Pall Mall, there is only one complaint to be made—that it is too splendid. The magnificence of its great square windows, its polished columns of red granite, and its three great tiers rather than stories, tend rather to overwhelm, and its general external appearance is hardly in accord with the quiet good taste which suits the English country gentleman. This, however, is a matter of opinion, and not of great consequence any way. The Club itself is emphatically *the* Club for country gentlemen whose "views" allow of their becoming candidates for its membership. Gentlemen who are patient may fairly expect to get into it, provided they belong to county families, or sit or have sat for a county.

Great monetary sacrifices for "the party," and a seat on the Conservative side of "the House," are claims seldom or never ignored in candidates; and in a recent instance the Club has set an example of common sense in opening its doors to a gentleman distinguished for his literary services to the Tory party; but the Carlton preserves not the less a county and a landed character. Good whist, good billiards, and good wine are to be found within its walls. Its smoking-room and balcony, with a fine look-out over St James' Park, is a noticeable feature, and the well-stored, church-like library witnesses to the literary culture and tastes of the members. The latest "serious" talk of politics is to be heard within the precincts of the Carlton, and a quiet gravity does not here mean a place behind the time.

THE CONSERVATIVE.

A handsome Club, situate in St James' Street, is well frequented, and may be regarded as "a good second" to the Carlton. The mansion is very handsome, and contains remarkably large rooms, adorned by some valuable paintings. The arrangements for the reception of strangers are not hospitable, but the claims of members on the Club's space are so pressing as to excuse and even make strictness necessary.

THE JUNIOR CARLTON.

A large Club in Pall Mall, opposite the "Great" Carlton. There being a roll of 2000, it is not so difficult to obtain entrance, but the Club is rather too crowded, in spite of spacious rooms and an abundance of rivals. It is regarded as *the* "feeder" to the more esoteric Carlton.

THE ST STEPHEN'S.

A Parliamentary Club on the Embankment, opposite the Palace of Westminster. Division bells, secret direct passages, and other conveniences make it the Club of the assiduous representative, for whose benefit special laws allow a partial membership, limited to the Session, and without entrance fee. It was founded in 1870, and its advantages soon obtained general recognition. The aim of the Club may be said to be Parliamentary, as is its *locale;* but the bulk of members are simply professional men. It is a fine, comfortable building, most sumptuously and tastefully fitted up, and in a splendid situation, with a steam-boat pier and a railway station immediately adjacent. It is not *too* crowded, and is a very "rising" Club. On important parliamentary nights, the Club is one of the most animated of sights.

THE BEACONSFIELD,

Situate at the south-west end of Pall Mall, and overlooking Marlborough House, this fine new Club attracts attention by its high narrow front, elaborate decoration, and handsome portico. The members are country gentleman, professional men, &c., owing a general allegiance to Conservative principles. Although this Club has only enjoyed one year of existence, it seems already to be an established success. It is not a dear club, and, although animated, not overcrowded. The bedroom accommodation for country members is excellent.

THE REFORM.

This is the leading Club of the Liberal party. The Reform is very rich, and, in a way, powerful; but in many respects it is not a satisfactory Club. The great men of Liberalism are invariably members thereof, but they seem to prefer the Athenæum and Brooks' to their "party" home. The tone is by no means Radical, but the committee have not the less been severe on wavering Whigs, whose partial defection from Liberal whip-service has in two or three instances been visited with expulsion from the Club. During the past year some animated debates have resulted in strengthening the hands of the more moderate members of the Club, who successfully opposed the attempt of the Liberal party "whips" to make the Club more Radical, in the interest of the party at large. The interior is very well designed, and the coffee and drawing rooms are of truly magnificent proportions. Recently, the Club has been thoroughly "done up," at a cost, we believe, of over £5000.

THE DEVONSHIRE.

A comparatively new Club, designed to be to the Reform what the Junior Carlton is to the senior institution of the same name. We do not hear of the venture being attended with particular success. This Club occupies the site of the far more famous Crockfords.

THE UNION.

This fine old Club, with its splendid position on the west side of Trafalgar Square, is entitled to rank among the leading clubs of the Metropolis. It is strictly non-political, and has an aristocratic reputation. Membership is difficult to obtain, the qualifications of candidates being closely scrutinized. One black ball in ten excludes. It is a dear club to enter; the yearly fee is rather under than above the average of first-class clubs.

VARIOUS CLUBS.

The OXFORD AND CAMBRIDGE, an old-established Club for University men. It is always full, and the younger members of the Universities have to find place in the JUNIOR and the UNIVERSITIES. The newly-formed ETON AND HARROW Club should relieve the lists of candidates. When the TRAVELLERS' was established, those having journeyed 500 miles in a direct line from London were considered a fair test now-a-days this requirement is hardly any restriction at all. Yet the Travellers' is one of the most charming and most select Clubs in London, elections being made with great caution, and membership having to be sought many years before being obtained. The Club is of great repute abroad, and its members return the compliment by a generous hospitality to foreign visitors. The situation between the Athenæum and the Reform seems to impart a sombre air, but it would be a libel on the Travellers' to call it "old fogeyish." Such an injustice could only be perpetrated by a black-balled applicant to share its "fogeyism." The WANDERERS' at the south-west corner of Waterloo Place, is a pleasant little Club of a less pretentious character. Two leading Clubs have now to be noticed; they are both "fast" Clubs, and they are both prosperous, eclectic, and dear. They are each the abode of a "set;" but the sets that frequent the ST JAMES' and the TURF make up between them a leading portion of London Society. They are, of course, non-political. The ST JAMES' is a diplomatic Club, to which all the embassies in London contribute, and in which the more cosmopolitan members of our Upper Ten Thousand find the most agreeable society. Play is high, and the "tone" is "fully up to the time, and a little in advance of it." The TURF is the *ci-devant* Arlington, and a star which from the third has rapidly attained to the first magnitude. It is *the* Club of sportsmen, and a quite safe Club for high stakes; but it is not only this, it is the centre of the latest news, and the rallying point of the briskest social life. The exclusive and aristocratic GUARDS' Club fairly claims place at the head of Specialist Clubs—the Clubs of the services and the professions. The ties of a common service have proved very good foundations for a large number of Clubs. The bonds of a profession chosen through family connexions or accident are not so firm as those of occupations self-chosen, so that *réunions* of musicians, archæologists, scientific and literary men might be expected to prove more successful than those of lawyers, doctors, or even of military and naval officers. Fact, however, does not seem to have borne out this inference. The ARMY AND NAVY Club is located in a fine building, and is reckoned one of the most popular in London. Like a French lady, a member of the "Rag" never grows old. Young men are plentiful, for it is a Club of over 2000 members; but men whom English Society rather too suggestively speaks of as "well preserved," and whom Parisian delicacy more thoughtfully designates as "in the flower of their age," this class also is well represented. The tone of the Club is somewhat "horsey," but not excessively so. The NAVAL AND MILITARY is another large Club, lighter in character than the "Rag," given to building new rooms and altering old ones, ambitious of playing a social part during the Season, and desirous of shewing to the fairer sex that Clubs are the friends, and not the enemies, of chivalry. Cambridge House is gay on Wednesday afternoons of the spring and early summer. The other Clubs of the services are—the old UNITED SERVICE in Pall Mall, the JUNIOR in Charles Street, and the CIVIL AND UNITED SERVICE (a large new Club) in Regent Street. Our Imperial dependency, its rulers and officials, is represented by the ORIENTAL, an old established Club in Hanover Square; and by the EAST INDIA UNITED SERVICE, a younger and more comprehensive Club, in St James' Square. The doctors have the MEDICAL in Spring Gardens, but the legal profession have, as far as we know, no specialist Club beyond the dull LAW SOCIETY, which has a part-occupancy of that dismally-splendid edifice, the Law Institution, in Chancery Lane. Literature is very imperfectly represented by the ATHENÆUM, a Club which inhabits a handsome and classic mansion opposite the Guards' Memorial, but which has a remarkably dry-as-dust reputation, and whose members' characters are supposed to have been prophetically suggested in the name of the Club's principal founder, the Right Hon. J. W. Croker. Membership is attained with difficulty. Well-connected mediocrities of literary tastes form the majority of the admitted, and amongst a few great "have beens," receding stars, and *magnorum nominum umbrae.* The GARRICK is a Club of a much more genial description. Actors, artists, playwrights, and the lighter order of *litterateurs*, are always to be found at home there, while applicants for membership are numerous. Eccentricity is well represented, and "pilling" fits are not unknown. The present quarters in Garrick Street are spaciou aud handsome. Membership is not expensive.

The ARTS CLUB, in Hanover Square, was instituted for the purpose of bringing together painters, writers, and men of science. The Club, as its name implies, is chiefly frequented by artists. No members are elected unless they have distinguished themselves in Arts or *belles lettres.* The BEEFSTEAK Club occupies two large rooms, on a first floor, in King William Street, Strand. It was originally a regular rendezvous for literary Bohemanism, but has recently been a good deal frequented by the more "starchy" patrons of literature. At the present time a good deal of anarchy prevails in the Club, which is neither a comfortable nor even well-established institution. Room being so limited, all strangers are absolutely excluded. The BERKELEY Club, 4 Grafton Street, W., is a good sporting Club, in a good position, and of good repute. It is rather a dear Club. The BURLINGTON Club, 17 Savile Row, was established for the promotion of private art exhibitions, and for supplying persons interested in art with special books and periodicals on the subject. The CHANDOS is a cheap, quiet Club, established in Langham Place. It has something of a literary tone, and offers special facilities to country members. The COACHNIG Club, the ROAD Club, the BADMINTON and the FOUR-IN-HAND Clubs are all associations of amateurs in the noble science of driving a four-in-hand. Their general *locale* may be said to be 100 Piccadilly, the head-quarters of the Badminton. During the Season, the Coaching and Four-in-Hand Clubs meet in the Park about one o'clock, and from the Magazine drive off in procession to some known place within a dozen miles of London. A good "meet" may be reckoned at about two dozen coaches; though on one ot the wettest days of last spring we saw a meet of twenty-nine. The COUNTY Club is a quiet rendezvous for country gentlemen. The terms of membership are easy, the subscription moderate, while the *locale*, Albemarle Street, leaves very little to be desired. The CUDTON is a well frequented literary, scientific, and artistic Club. It is not very fashionable, but it serves very well the purpose for which it was established. The Club is situate at No. 3 Adelphi Terrace. The KENNEL Club, 29A Pall Mall, was established for the promotion of good breeding of dogs, for the regulation of shows and trials, and for the bringing together of gentlemen interested in the kennel. This Club aspires to be in the matter of dog shows and competitions what the Jockey Club is in relation to horse racing. May it prosper in its endeavours to regulate exhibitions, and to encourage sport. The NATIONAL Club is the title which, with a droll arrogance, the members of a particular religious school of thought have attached to their place of meeting and social confabulation. The Club consists of a small number of clergy and laymen of extreme "Evangelical" views. The Club has its habitat in Whitehall Gardens. The ORLEANS is a fast, social Club with a town house in King Street and a country mansion in Orleans House, Twickenham. It is open to all the "livelier" members of Society, and it only requires fine weather during the season to be one of the gayest and most attractive of fashionable institutions. Orleans House is a favourite drive-out of the Coaching Clubs. The intention of the founders was to promote meeting enjoyment and good fellowship among all persons "received in good Society," and the Club has done well so far as such a wide intention can be carried out. The PALL MALL, Waterloo Place, is a quiet Club, rigidly non-political. It has a very good repute, and, at the same time, is not overcrowded. The PORTLAND and WYNDHAM are two excellent Whist Clubs, where stakes are regulated, and where good play, in good Society, is to be had. The former is situate in Stratford Place, the latter in the new corner of St James' Square. The WHIST Club, the hours of which are from four to four, is a Club open, on a slight payment, to all members of the famous political and social clubs. The RALEIGH is a fast gambling Club, much frequented by a certain section of the *juenesse doree*, and by young officers of Her Majesty's services. The ST GEORGE'S, 1 Savile Row, is a rather exclusive Club, formed for the social convenience of the leading English Roman Catholics. The THATCHED HOUSE is a small social Club, with a name better known to the former than to the present generation of club-men. With the WHITEHALL, a good social Club in Parliament Street, we bring our list to a close. No Country Gentleman, no professional man, need lack a comfortable reputable Club, where he can meet an acquaintance or entertain a friend. With all sorts of predilections, sporting, scientific, or literary, there are Clubs for the associations of the interested, and this readiness of combination and success of arrangements, dependent entirely on social goodfellowship, constitute, in our idea, at once a distinctive and not unpleasant side of English character.

FARMERS' CLUB.

This Club has for its object the discussion of subjects bearing upon agriculture, and to afford a point of union for farmers and others connected with agriculture. Two-thirds of the members must be either chiefly or indirectly interested in or connected with the. cultivation of the soil. Practical farmers and scientific men of all countries are eligible. It is located in the Inns of Court Hotel, and the entrance fee is £1, 1s., with a yearly subscription of £1, 1s.

SMITHFIELD CLUB.

The objects of this Club are the exhibition of fat live stock, cattle, sheep, and pigs, for which prizes are offered. The Club also holds an exhibition of implements, but there are no prizes offered. Sir B. T. Brandreth Gibbs is the Hon. Secretary. The shows are held at the Agricultural Hall, Islington, N. The annual meeting is held early in December. (This year's commences December 8.) The number of entries for stock are usually over 400; machines, &c., about 150 exhibitors. The prizes, in money and plate, amount to upwards of £2800 annually. The "Farmer's Hand-Book and Agricultural-Show Companion" (published at 13a Salisbury Square, Fleet Street, London, E.C.) is referred to for a succinct history of the Agricultural Shows.

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Are of GUARANTEED SUPERIORITY, dry well, and offer many advantages to the general public. They are, on being opened, for immediate use, requiring no mixture or addition of any kind, and being hermetically closed, remain unaffected by cli time. Can be applied by the most inexperienced and be had of any shade.

Denton and Jutsum's Silicate Paints.

These paints are manufactured in every shade of colour. Their hard, petrifying nature makes them specially applic work liable to extreme exposure, they are not affected by heat or cold, but are practically indestructible, and are at th time, from their covering properties, very economical.

Denton and Jutsum's Anti-Corrosive Colours.

These colours are applicable to every description of Brick, Compo, Iron or Wood Buildings, Iron Roofing, Fencing, Wag Farm Implements, or any exposed Work; they become extremely hard and do not blister, are very durable, and from their corrosive properties are an effectual protection against atmospheric influences, such as stormy weather, scorching suns, or injurious effects of sea air. They can be manufactured to any shade or colour that may be desired.

Denton and Jutsum's Metallic Oxide Paints

Are specially prepared and adapted to Bridges, Girders, Locomotives, Iron, and Wood Waggons, Iron Bridges, Stea Gasometers, Boilers, Iron Fencing, or any work much exposed to the weather. They possess great body and are more econo than lead, have a perfectly fast colour, powerfully adhesive properties, do not blister or peel off, resist both damp and heat, entirely prevent the corrosion of the metal.

Denton and Jutsum's Zinc Whites.

These whites are for many purposes much superior to White Lead, they are not so liable to turn yellow, and work equally in oil-flatting or distemper. Of the three qualities, the Snow-white is the most brilliant white manufactured.

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Are manufactured in all shades, and dry with a rich gloss. Two coats may be given in one day for tin and iron work, many decorative purposes these paints are unequalled.

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For Railways, Tram Cars, Cylinders, and Heavy Machinery.

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Manufacturers of Gold and Silver Bronzes, extensively used by the Leading Implement Makers, for preventi rust and for giving a handsome finish to Ironwork.

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INTRODUCTION.

ALTHOUGH the implement trade has not suffered during the year so severely as some others from the prevailing depression, yet it has been seriously affected. It has borne its fair share of the bad times. The wide-spread agricultural distress naturally diminished the usual demand for implements and machinery. Farmers had not the means sufficient to justify them in sinking capital in the purchase of expensive appliances of the farm. Implement makers, therefore, have had a large stock on hand which they have been unable to dispose of, and many of them have been compelled to reduce the hands in their employ to a considerable extent. The trade in all agricultural implements has been very bad, especially in the most expensive. Harvest prospects appeared gloomy a long time before the harvest commenced. It was early foreseen that average crops were impossible, and that a fifth bad harvest in succession would have to be endured. Already farmers were sufficiently depressed, but with a lower deep still in view, it was only natural that they felt little temptation to purchase new harvesting and thrashing machinery for thin and badly-yielding grain crops. And in reference to all kinds of agricultural implements—from ponderous steam-ploughs to small horse-hoes and hand-drills—the result has been the same, namely, that farmers during the past year invested as little money as possible in these articles, and implement makers have suffered accordingly.

In the history of the inventions of the year there are not any startling novelties to record as new agricultural appliances, but in mechanical detail much ingenuity has been shown, many instances of which will be found recorded in the following pages. The year has been marked more by improvement and development than by actual creation. This was clearly manifest at the great International Exhibition of the Royal Agricultural Society, held at Kilburn last summer. In extent and in variety the show of implements was of surpassing excellence, and every department showed sound progress in invention. At the exhibition of ancient implements held in the showyard we were enabled to mark the stages of progress made within the present half-century to implement makers—since the time when Bell's original reaper worked at Glasgow show in 1829 and received a prize, and the year 1834 when Messrs Ransomes, Sims, and Head invented a double-furrow plough, and Messrs Howard a two-wheel iron plough in 1840. But the progress made during a much shorter period has been remarkably great, and familiar to all who have watched our agricultural exhibitions within the last decade. In steam-cultivating machinery, and in reapers and mowers especially, there has been a considerable advance, and last year (1878) will be remembered as the first in which sheaf-binding machines were introduced with any measure of success. Several eminent makers have since turned their attention to this arrangement as necessary to complete the reaper as a harvesting machine, and the outcome is of a most promising nature. Four silver medals only for new inventions were awarded at Kilburn, but several makers were honoured with a first-class mention for novel improvements, &c., which shows the general features of the history of agricultural engineering in the last twelve months to be of the character we have already described. The awards made by the adjudicators were as follows:—Messrs A. Ramsome and Co. received a silver medal for machinery for making butter-firkins, Messrs Samuelson and Co. for a patent hay-press, Messrs McKenzie and Sons for a gorse masticator, and Mr G. De Laval for a Swedish cream seperator. The "first-class mentions" were given to Messrs R. Hornsby and Sons for a new disc in their patent turnip cutter, Mr William Brenton for patent gate and door fastenings, the Kirkstall Forge Company for a double-action straw shaker, Mr George H. Innes for a thrashing-machine drum-guard, Mr Francis Ley for a detachable malleable-iron drive-chain, Messrs Polyblank and Co. for Knowling's band-sawing machine, Messrs Nalder and Nalder for a straw elevator attached to a thrashing-machine, and Mr Thomas Christy and Co. for a hydro-incubator.

Agricultural implement makers continue to exert themselves, and there is no lack of inventive skill or application amongst them. There is no deficiency of genius, and any day may bring to notice some new and important invention likely to influence the progress of agriculture in the future as much as either of the great inventions of the past. With praiseworthy pertinacity implement makers are continually racking their brains for some new labour-saving appliance for the benefit of the farmer. Notwithstanding the depression of trade, and that the farmer is not such a good customer as he was some years ago, they are ever faithful, and continue to be possessed with the "magic of patience." They have not lost heart. With the revival of trade, of which there are some signs, and the improved condition of agriculture, of which there is some hope, they will labour with renewed vigour, and enter on new fields of success. Already we hear privately of various firms having new inventions on hand, the greater number of which will make their appearance next year—of improvements in mowers and reaping machines in string and wire binders; in thrashing machines, straw shakers, and drum-guards; in steam ploughing tackle and drainage machinery, and in various other agricultural appliances. We are not authorised to mention the names of the inventors or the nature of their new work, but we feel assured that the year 1880 will be noteworthy for the display of increased activity in invention on the part of the makers of agricultural implements and machinery.

Implements and Machines.

[Specially written for THE FARMERS' AND COUNTRY GENTLEMAN'S ALMANACK.]

MESSRS ROBEY AND CO.

Messrs Robey and Co., of Lincoln, are of high repute as manufacturers of steam-engines of various kinds. Their "Improved Patent Portable Steam-engine" is illustrated at fig. 1. This engine is eminently adapted for driving agricultural machinery and for all purposes where steam power is required in a portable form. It has great strength in all its parts without excessive weight, and it is exceedingly simple in design, all valves being arranged so that they are open to inspection by removing one cover only; the working parts being as few as possible, and being carefully marked, so that a labourer of ordinary intelligence can take them to pieces and re-arrange them without difficulty. Great economy of fuel is secured, and also great power. The cylinders and others parts of Messrs Robey and Co.'s engines being of extra size, each engine will give out much more than its nominal power. In their proving shed they are tested under the brake with a load equal to three times their nominal power.

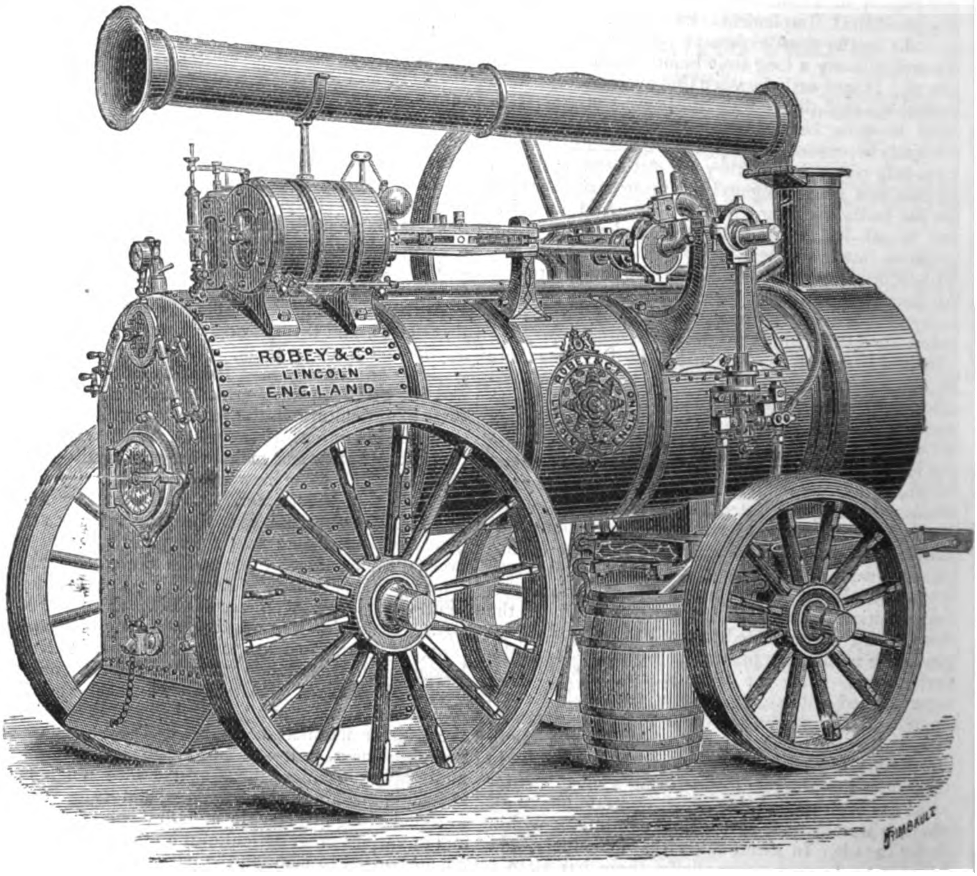


Fig. 1.—Robey and Co.'s Improved Portable Steam Engine.

Messrs Robey and Co.'s New Vertical Steam-engine is erected upon a massive cast-iron standard, and is thus independent of the boiler. The base-plate serves not only as a tank, but also as a most efficient water heater. The number of parts is reduced to a minimum, thus ensuring great simplicity. Every part is most easy of access for adjustment and examination. The engine is provided with a self-starting feed pump, and is fitted with an improved governor, which works an equilibrium valve, effectually controlling the speed of engine under great variations of load. Every part is accurately finished to template, and only the best materials and highest class of workmanship are used throughout.

The "Robey" Traction Engine (fig. 2) is an improved design. This engine is not only self-propelling, moving itself and its accompanying machinery from place to place, but it is also calculated to do all the work of a farm, such as ploughing, thrashing, sawing, &c., and, when not employed at farm work, can be used for hauling heavy goods on common roads. The engine, boiler, and tender, with its gear, are each complete in themselves, and so simply combined that any intelligent labourer can take the whole apart and connect them again in a few hours. Every part of engine, boiler, and travelling gear is made accurately to template. The whole of the gearing in these engines is made of steel, and large surfaces

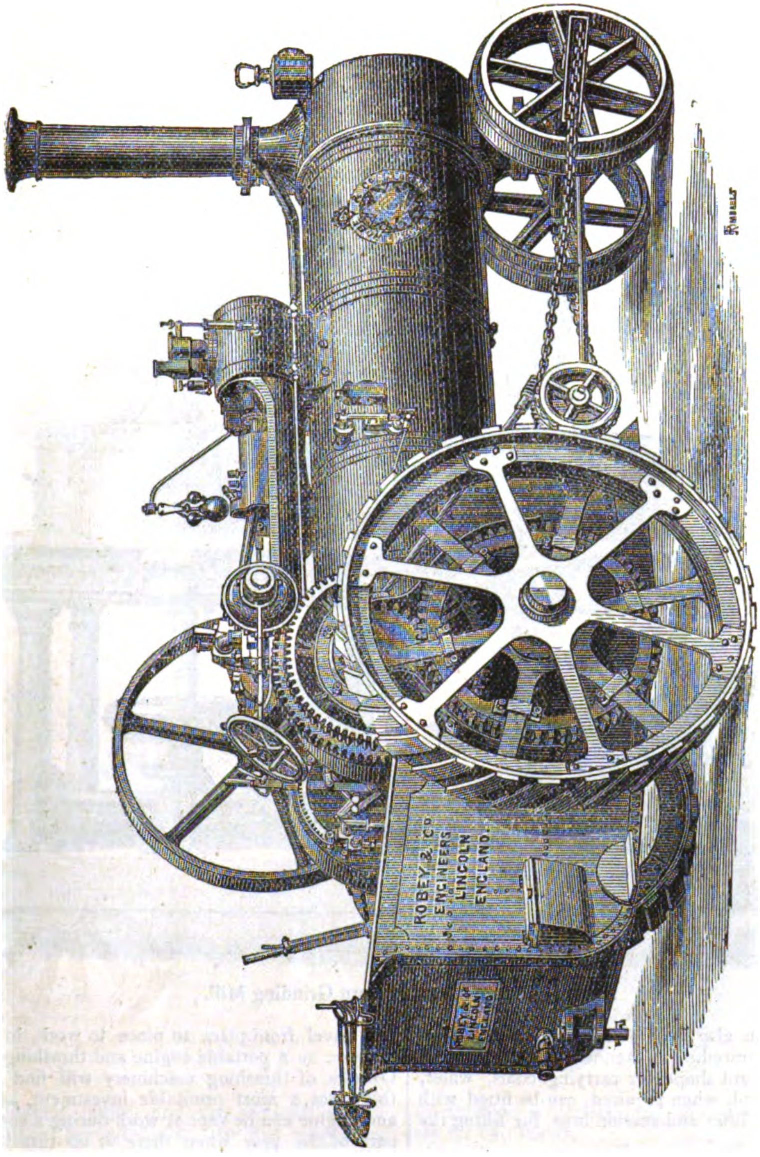


Fig. 2.—Patent "Robey" Traction Engine, or Road Locomotive.

are given to all wearing parts. The whole of the levers for working the engine are brought conveniently together, so that one man can without moving have complete control over it. The patent system of steering enables the engine to be guided in any direction with very slight effort on the part of the driver. A differential motion is introduced into the driving gear, by means of which, when turning a curve, one of the driving wheels is accelerated in the same proportion that the other is retarded; thus the sharpest can be turned without anything being thrown out of gear, or any strain being put upon the engine.

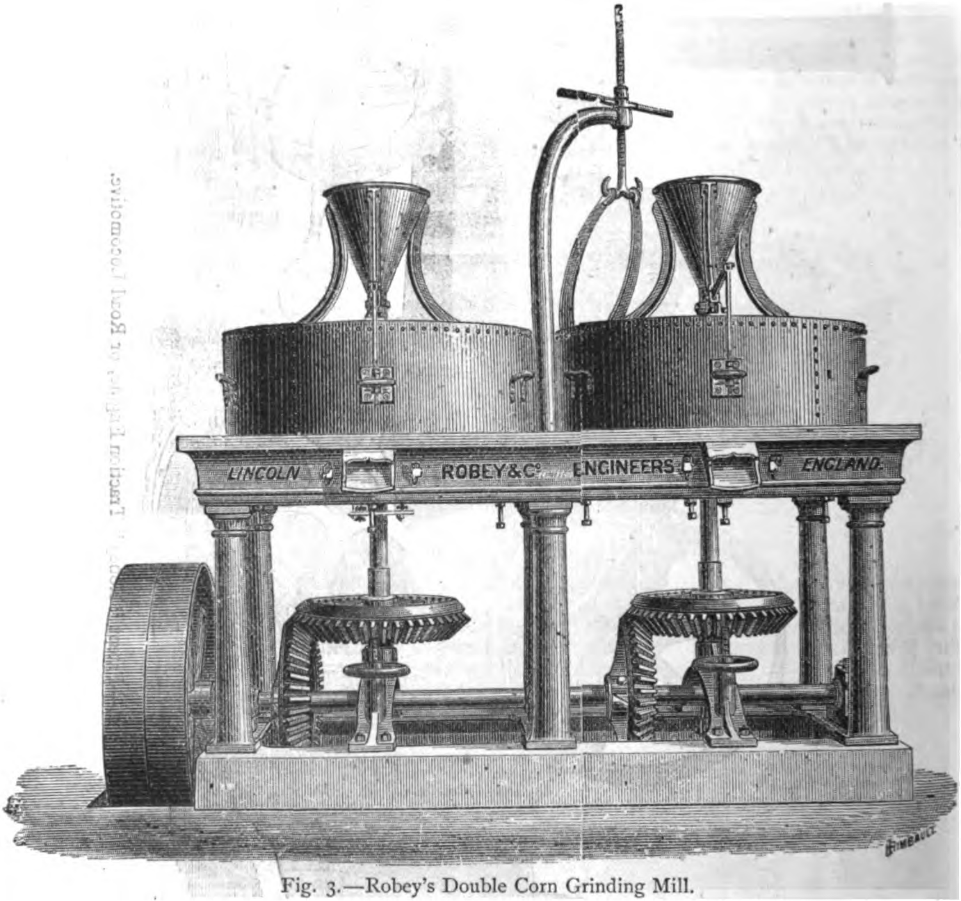


Fig. 3.—Robey's Double Corn Grinding Mill.

The engines can also be fitted with fast and slow speeds when required. The tender is made of ample size and convenient shape for carrying coals, water, tool box, &c., and, when required, can be fitted with improved water-lifter and suction hose for filling the tank.

The Double Corn Grinding Mill is intended for large occupations where a steam-engine is employed, as it will grind all kinds of grain for farm purposes. The stones and machinery are fixed in a metal frame of neat and compact design, whereby it is rendered both strong and portable. This mill is simple in construction, and easy to manage and adjust. The top or runner stone is carried on an upright spindle, which receives its motion from a pair of bevel wheels, one of which is geared with wood. Two pulleys are used, one being fast on the shaft, for giving motion to the upper stone, and the other being loose, to allow the belt to run when the mill is not required to work. The pulley can be fitted on either end of the driving spindle, to suit any situation.

Robey and Co.'s improved Portable Corn Mill has been designed to meet the requirements of smaller occupiers, and, being all complete within itself, and mounted upon strong travelling wheels, it can travel from place to place to work, in the same manner as a portable engine and thrashing machine. Owners of thrashing machinery will find a mill of this class a most profitable investment, as the mill and engine can be kept at work during a considerable part of the year when there is no thrashing to be done.

MR WALTER A. WOOD.

Who has not heard of the mowers and reapers of Mr Walter A. Wood? The total production of this class of implements by the "Wood" manufactory in twenty-six years amounts to 327,012 machines, over 200,000 of which were grass-mowers. They have competed several hundred times in field trials in Europe alone, and there have been awarded to their mowers upwards of 200 first prizes within the present decade alone.

The new controllable five-rake reaper (fig. 4) of Mr Walter A. Wood, 36 Worship Street, E.C., is pronounced to be perfect, the ease and certainty with which the size of the sheaf can be regulated calling forth the highest praise, and the strength of the machine certified beyond doubt. In this reaper the rakes can be set so that every second, third, fourth, or fifth rake will deliver automatically, and the driver can make any rake a beater by pressing the foot treadle, or all five rakes can be set for swathing. The fifth rake gives this machine a decided advantage in laid and tangled grain; also in short and thin crops, rendering it possible to pick up *down* crops, and preventing short stuff from falling before the knives when cut. The rakes or beaters, together with the gearing, are supported a sufficient distance above the finger-bar to prevent straw from winding on the shaft and clogging the gearing. The cam being inverted and closed entirely on top, no straw or other substances can get into it. All the gearing is covered. The bearings are brass bushed, and fitted with the patent spring oilers. The *balance* of the machine is perfect, and the draught light and easy for two horses.

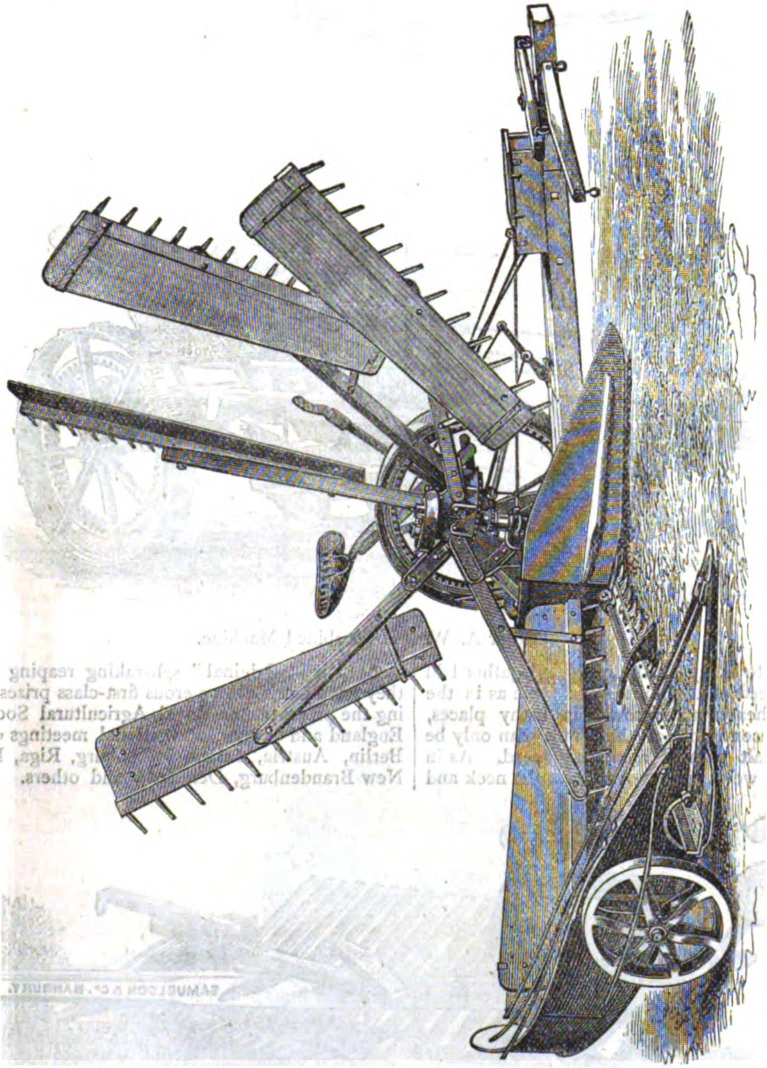


Fig. 4.—Walter A. Wood's New Controllable Five-rake Reaper.

Mr Wood's New One-horse Mower was first introduced in 1878, and reports pronounce it one of the most successful one-horse mowers ever produced. All gearing has been removed from the wheels, reduced to the smallest possible compass, and covered to protect from dirt and dust. The frame is of iron, and there are few bearings. Its strength, efficiency, and extreme lightness of draught is testified to by all who have purchased this new one-horse mower.

In the Combined Mower and Reaper (fig. 5) the reaping attachment is simple and efficient, being constructed to turn up for travel on the road. The raker has a seat on the machine, with the driver, and is so placed as to easily lift the crop and gather laid grain. The speed of the knife is the same as in the mower. The heavy undergrowth in many places, and the moist condition of the straw, can only be satisfactorily dealt with at a mowing speed. As in the mower, the weight is removed from the neck and back of the horses, the draught being direct, and under the pole. The Combined Machine can be especially recommended as a perfect manual delivery reaper, and is at the same time all that can be desired as a mower.

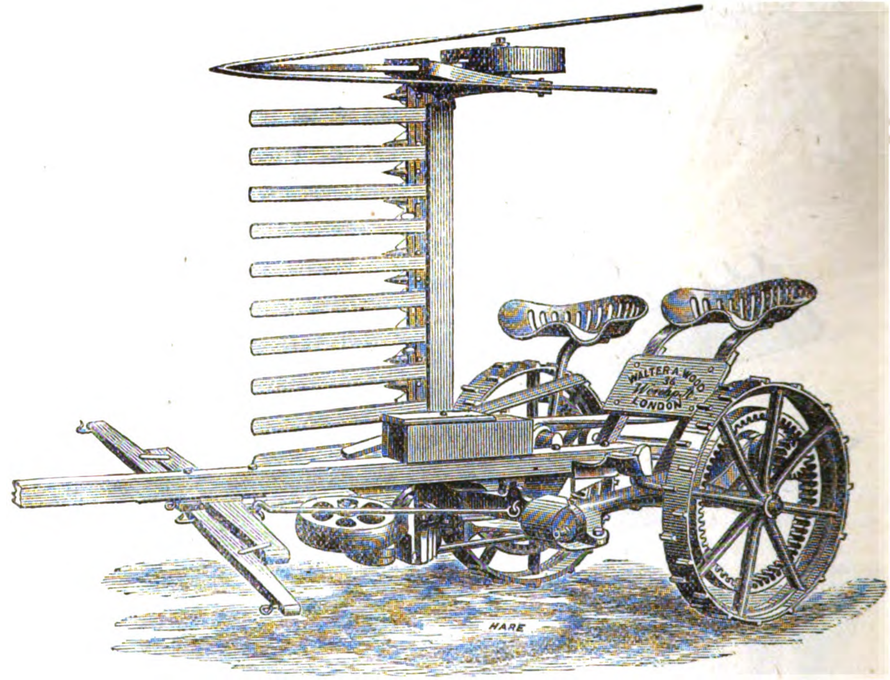


Fig. 5.—Walter A. Wood's Combined Machine.

MESSRS SAMUELSON AND CO.

The reapers and mowers of the old-established Banbury firm of Messrs Samuelson and Co. have gained high repute for design, constructive detail, lightness of draught, and general efficiency of work. For their "Original" self-raking reaping machine they have received numerous first-class prizes, including the prizes of the Royal Agricultural Societies of England and of the International meetings of Paris, Berlin, Austria, Lille, Gothenburg, Riga, Holland, New Brandenburg, Denmark, and others. In addition to this well-known reaper, they have amongst others an excellent harvesting machine in the "Handy" reaper. The two-horse "Handy" (fig. 6) was introduced some three years ago, and its reputation has steadily increased ever since. It will

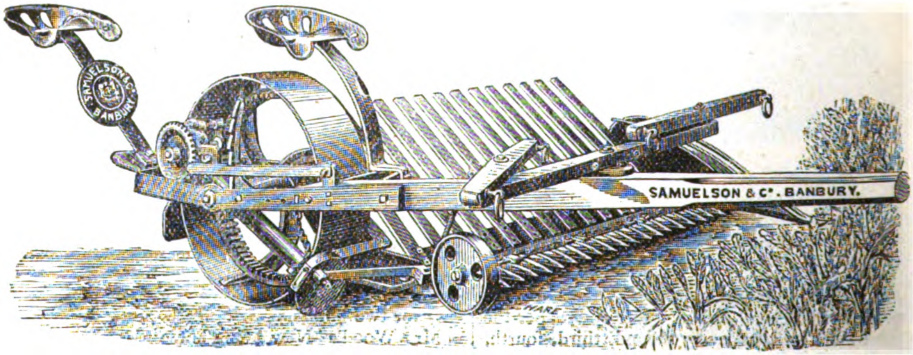


Fig. 6.—Samuelson and Co.'s Manual Delivery Two-horse "Handy" Reaper.

cut perfectly well if the horses are walking at even slower speed than in ploughing. Although the width of cut is 5 feet 3 inches, it is easy work for two horses, and the balance is so perfect that there is no weight whatever on the horses' necks.' This machine is constructed to meet the requirements of arable farms where the practice of manual delivery still prevails, and where an extra strong yet easily managed machine is in request; on account of the lightness of draught, the extra width of cut is not felt by the horses, whilst it enables a greater breadth to be cut down in a given time, especially in laid and twisted crops, when the corn lies towards the machine.

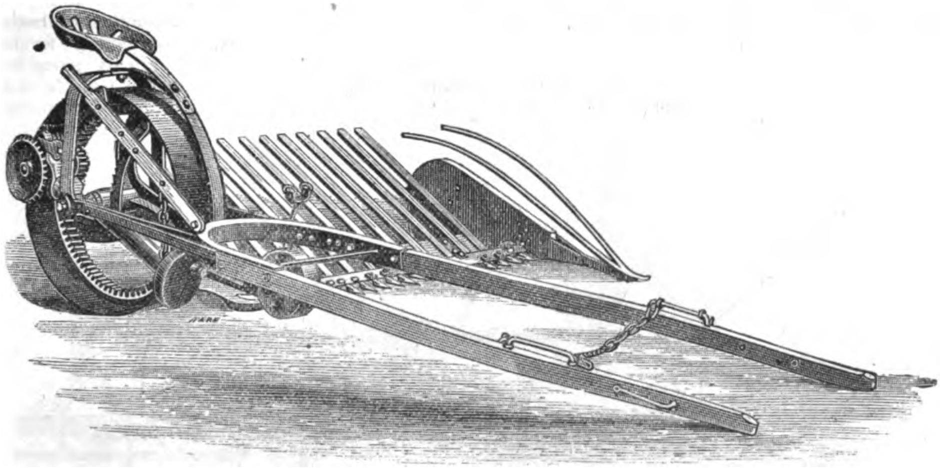


Fig. 7.—Samuelson's and Co.'s Manual Delivery One-horse "Handy" Reaper.

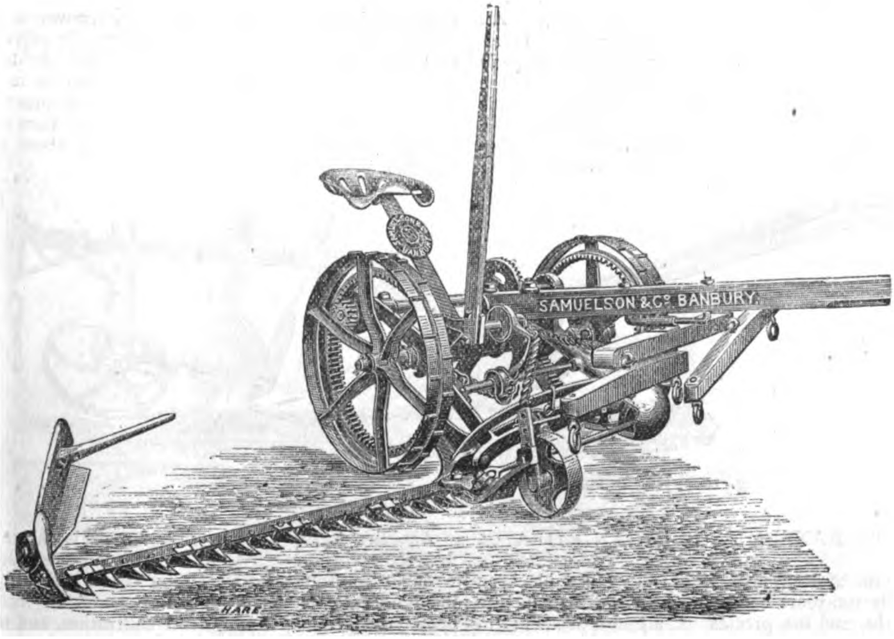


Fig. 8.—Samuelson and Co.'s "Gem" Balance-draught Grass Mower.

The one-horse "Handy" reaper (fig. 7) is a modification of the "Handy" Reaper and is fitted with a pair of shafts instead of a pole, the width of cut is 4 feet 9 inches, and it is exceedingly easy work for a single horse. This, as well as the two-horse "Handy," is fitted with Messrs Samuelson and Co.'s new patent welded steel and iron fingers, which give so much satisfaction to purchasers of their machines.

The "Balance-Draught" mowers of the same firm are remarkable for strength, simplicity, easy management, light draught, and low cutting. The "Gem" Balance-Draught Mower (fig. 8). These machines are characterized by absence of weight on the horses' necks, the "inclined" cut giving very close cutting and the power of dealing with very hard crops. The "Gem" has been specially constructed to meet the requirements of those desiring a mower cutting on the right hand side of the driver. The fingers are of patent welded iron and steel, and are of an open pattern, specially adapted for meadows with uneven bottoms and containing mole and ant hills. The oiling arrangements have received special care. All the bearings are of best gun metal, and can be replaced with little trouble. A novel and exceedingly simple plan has been adopted for removing the sickle, rendering this operation one of a few seconds only. Reaping attachments for converting it into a combined machine for cutting corn as well as mowing grass are supplied with this machine if required.

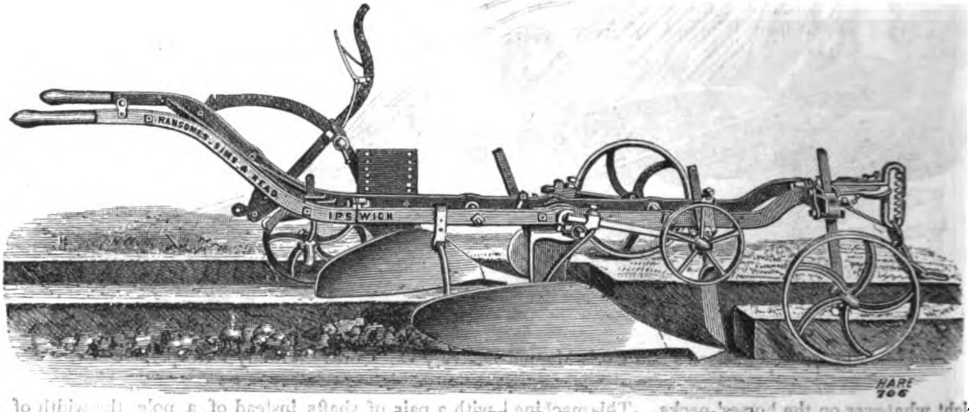


Fig. 9.—Ransomes, Sims, and Head's Double-furrow Plough.

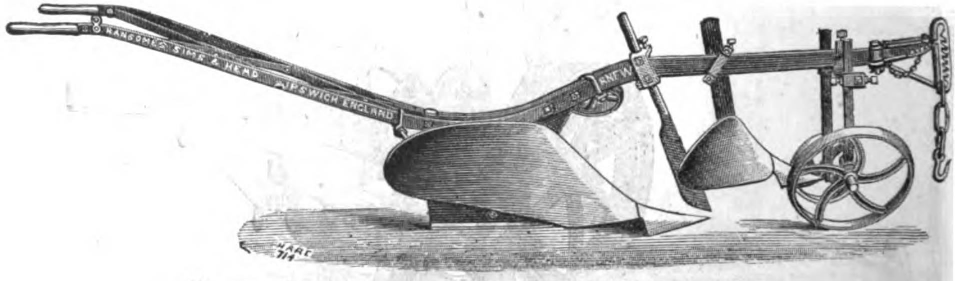


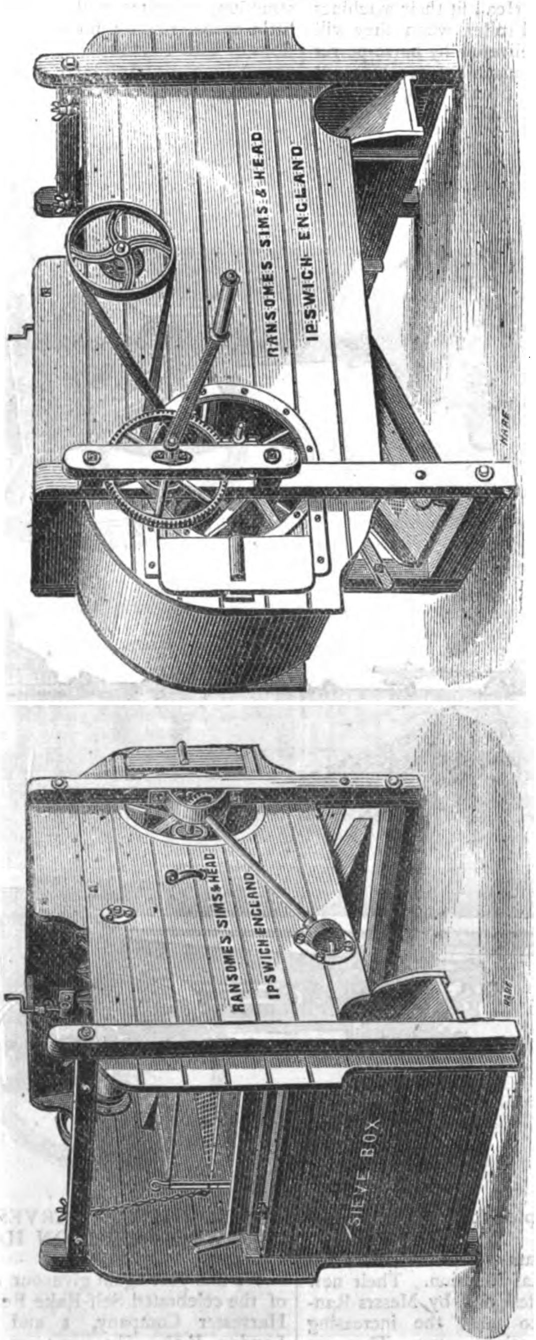
Fig. 10.—Ransomes, Sims, and Head's Single Plough and Parer.

MESSRS RANSOMES, SIMS, AND HEAD.

The firm of Ransomes, Sims, and Head has been for nearly 100 years connected with the manufacture of ploughs, and the greatest of all improvements in the plough—viz., the patent chilled "self-sharpening" ploughshare—was invented by Robert Ransome in 1803. For more than a generation has the firm been well known to the agriculturists of the kingdom, for in 1839, at the first exhibition of the Royal Agricultural Society, a special vote of thanks was tendered to the Ipswich engineers for having, at great trouble and expense, sent several tons of implements and machinery in waggons to the Oxford show.

Fig. 9 represents a double-furrow plough, with a simple and efficient lever arrangement for lifting the plough out of work and turning it on the headlands. It differs from other double-furrow ploughs, for instead of being fitted with two ordinary ploughing bodies, the hinder one is removed, and a special skim body is put in its place. As this skim body is placed in the rear of the plough, the surface soil is thrown to the bottom of the previous furrow, and in the next round the front plough body completely covers it up. The skim body is so arranged that it can be adjusted to plough from 2 to 6 inches deep, and the total depth of work of the two ploughs will be 10 to 12 inches. This has been proved to be a very practical arrangement in work, the ploughs that have been sold having given great satisfaction. Draught, about 3 to 4 horses.

An extra deep single plough and parer is shown in fig. 10. This plough is fitted with an extra deep wrought-iron frame, with a strong beam, and with a deep breast, capable of ploughing about 14 inches deep. It is intended for deep cultivation, and will turn a furrow about 12 inches wide. As shown in the drawing, it can be fitted with a large skim coulter, which is, in fact, a small plough body placed in advance of the deep plough, which will pare off the surface when required to a depth of 5 or 6 inches, and deposit it in the open furrow, and the part so pared off will be completely buried by the furrow turned by the deep breast behind. It is especially useful for all deep work—for beet-root cultivation, burying couch grass, weeds, &c. Draught, from 4 to 6 horses.



Figs. 11 and 12.—Ransomes, Sims, and Head's Dressing Machines.

Messrs Ransomes, Sims, and Head have brought out a new series of dressing machines (see figs. 11 and 12), which they recommend with confidence as being capable of doing a large amount of work in a short space of time, and with very little power; and which, for excellence of design, materials, and workmanship, are second to none in the trade. In these machines the bottom screen is made to oscillate so that all the riddles and sieves are kept in constant motion, and the dressing power of the machine is considerably increased. Instead of the extra blower adopted by some makers for dressing rough stuff, Messrs Ransomes, Sims, and Head fit their machines when required with a spiked roller, when they will dress rough stuff such as is delivered by horse-power thrashing machines. These machines are sent out fitted to dress wheat, barley, beans, peas, oats, and rye. They can also be adapted for seeds, at a small additional charge.

The different kinds of steam-engines manufactured by this firm are worth especial attention. Their new vertical engines have been designed by Messrs Ransomes, Sims, and Head to meet the increasing demand for this class of motive power. They are specially adapted for driving chaff cutters, corn crushers, and grinding mills, root cutters and pulpers, for working small circular saws, pumps, hoists, and fans, and for use in laundries, breweries, maltings, printing offices, warehouses, small factories, &c. These engines are very simple in design and construction, compact and self-contained, occupy but little space, require no extensive outlay for foundations or fixing, stand steady when in work, are economical in consumption of fuel, and easily managed and kept in order.

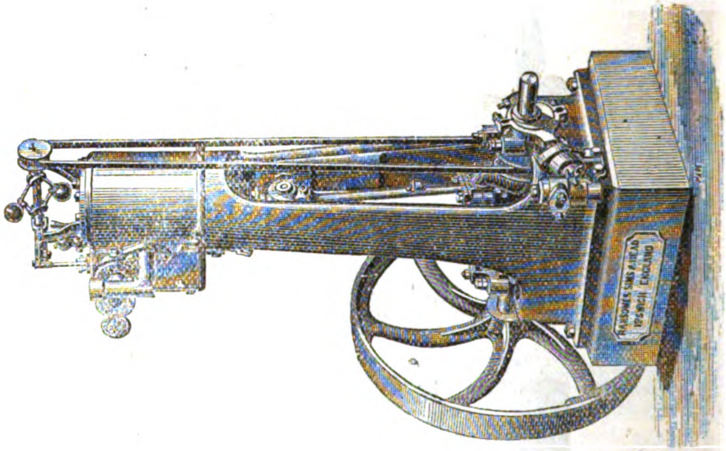


Fig. 14.—Engine Without Boiler.

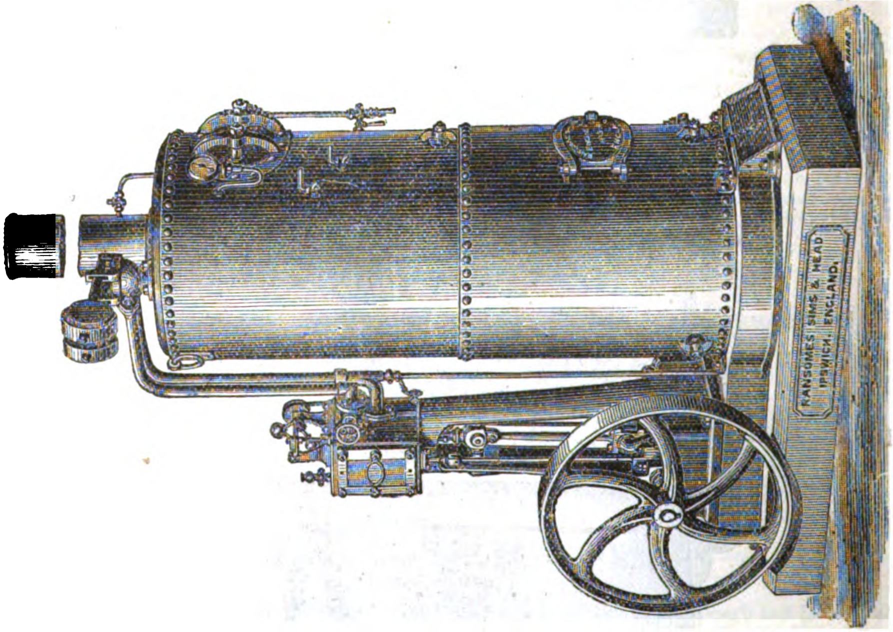


Fig. 13.—Ransome, Sims, and Head's Vertical Engine and Boiler on one Foundation Plate.

THE JOHNSTON HARVESTER COMPANY'S WROUGHT-IRON HARVESTER.

We this year again give our readers a cut (fig. 15) of the celebrated Self-Rake Reaper, of the Johnston Harvester Company, 1 and 2 Chiswell Street, London, E.C. The great success of this Company last season—success which we said was well deserved—has this year been supplemented by many most important prizes, obtained in competition with all the leading machines of the day.

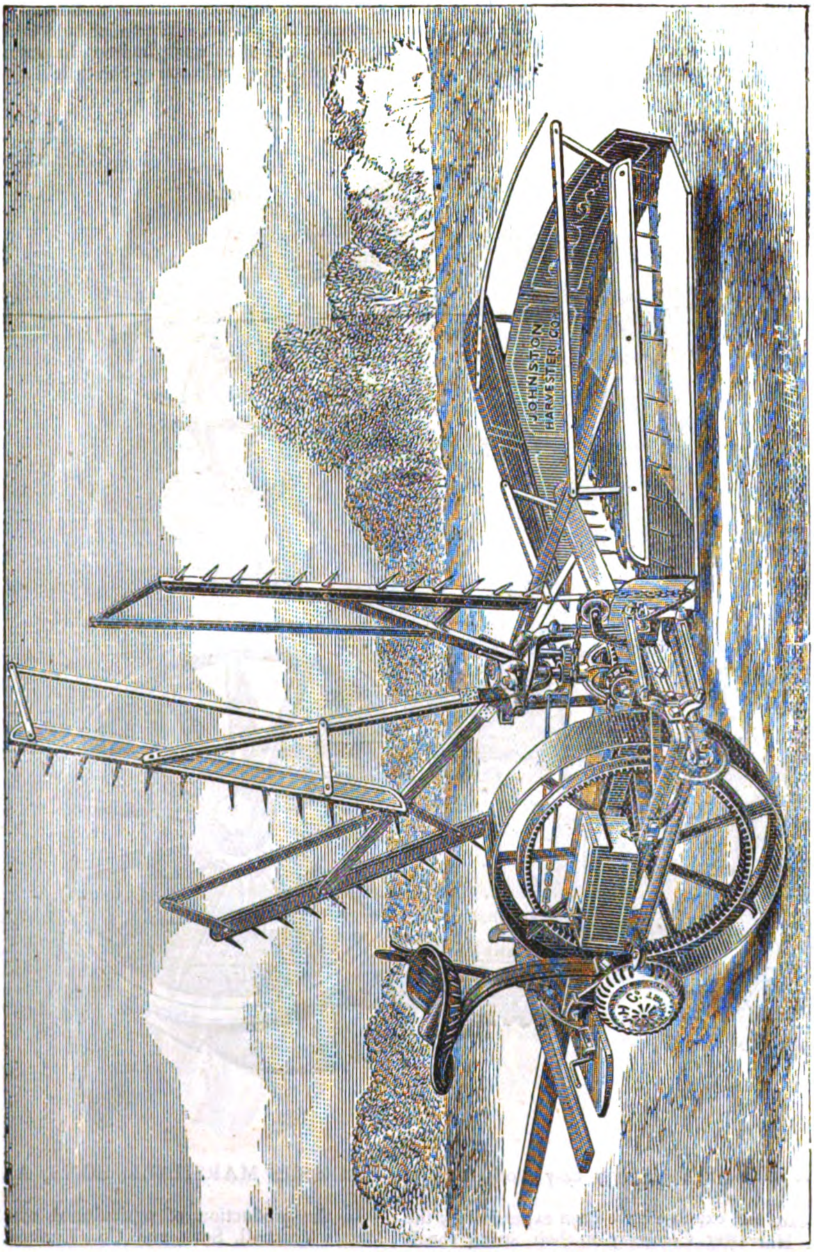


Fig. 15.—The Johnston Harvester Company's Self-Rake Reaper.

The main features of this machine are its double speed, which can be regulated fast or slow, according to the nature of the crop; its frame and similar parts, which are made of wrought iron, and capable of standing any amount of rough work; the lightness of its draught, which is about the lightest we have ever seen; and the very ingenious arrangement of the rake track round the cam, which appears now to be the accepted principle of this part of a reaper, as the most successful means of controlling the rakes. That this Reaper should carry off the highest prize at both the Vienna and Paris Exhibition field trials is not surprising, considering the high esteem it is held in by those using it, and the very large number of prizes awarded it all over Europe for several years past. We do not wish to trouble our readers with mechanical details, which possibly would not interest them, but they may feel assured that a Reaper which has attained such celebrity as the Johnston must be constructed on the most approved scientific principles, of good material, and by skilled workmen.

The wrought-iron mower, combined self-rake reaper and mower, and the "Continental" reapers, both one and two-horse, of this company, have also been very successful in prize-taking. The one-horse "Continental" self-rake reaper especially is a remarkably good machine, and, from what we have seen of it in the field, is very easy work for one horse.

Great care and expense have been expended by the Johnston Harvester Company on their string sheaf-binding reaper: a machine, we believe, first attempted by them, and which they now offer for sale, feeling confident of its superiority. It is considered one of the characteristics of this firm, that before they offer anything new to the public, they must feel thoroughly satisfied themselves that it will suit its purpose. Under these circumstances the string sheaf-binder will, it is expected, be a boon to agriculturists. After long experimenting with this machine in all sorts of grain, and in different climates, it has at length been perfected to the satisfaction of a firm of agricultural engineers, rather fastidious as to what they offer the public. We understand that both this machine and the wrought-iron harvester will be exhibited at the forthcoming Smithfield show.

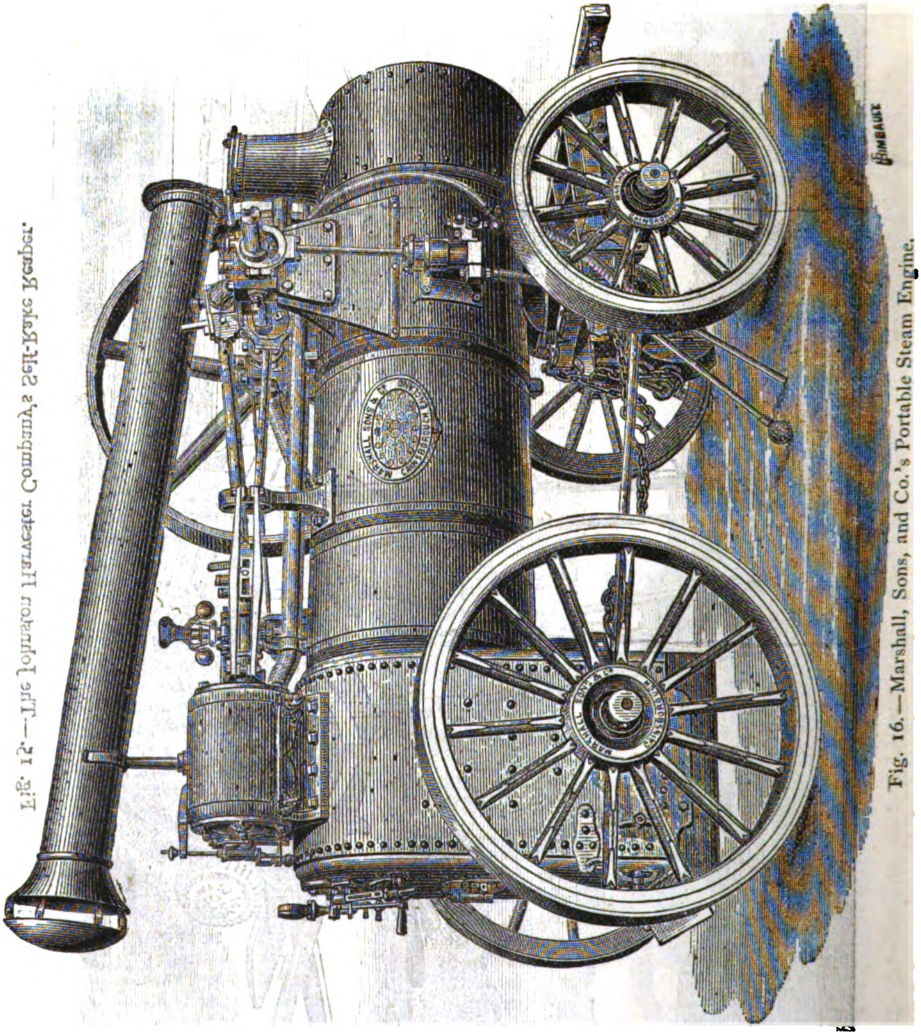


Fig. 16.—Marshall, Sons, and Co.'s Portable Steam Engine.

MESSRS MARSHALL, SONS, AND CO.

In the production of agricultural machinery the Messrs Marshall, Sons, and Co., Limited, of Gainsborough, have always used the best material, and in all their arrangements they have studied to attain perfection of design, simplicity of construction, and economical, durable, and efficient working.

Their improved portable steam engines with one cylinder (fig. 16) are in every respect well made, and are applicable for driving thrashing machines, grinding and crushing mills, brickmaking machines, mortar mills, centrifugal and other pumps, circular saws and other wood-working machines, cotton gins, &c., and to the general purposes of contractors and builders, and for steam cultivation. They are of very large proportions, with ample strength and heating surface in the boilers. The cylinders are made of cold blast iron, with the outer barrel and valve chest in one casting, the inner or working barrel being cast separately of special hardness, and is afterwards tightly forced into the outer casting, thus forming a perfect jacketted cylinder. Wrought-iron crank shaft brackets are double rivetted to the barrel of the boiler, and strongly stayed, supporting special carriages firmly bolted thereto with turned bolts for carrying the crank shaft; these brackets take a large bearing on the boiler, they are strong and light, and they obviate the possibility of leakage.

The portable steam thrashing and finishing machines (fig. 17) manufactured by this firm are compact in design, and effect the various separations without injury to the grain or straw. They are characterized by great simplicity of the working parts and non-liability to derangement. There is an easy access to the internal details and they are very strongly constructed throughout.

Marshall's Patent Safety Drum Guard is a thorough preventive against accidents in connection with the thrashing drum occurring to the attendants, as the drum mouth is protected from the front, back, and sides as follows:—

In the front any undue pressure coming upon the feed board releases a board underneath same, which instantly closes over the drum mouth in a direction from the feed board. To protect the drum from the back a hinged hood is provided, which on any weight falling upon it drops over the mouth and closes it.

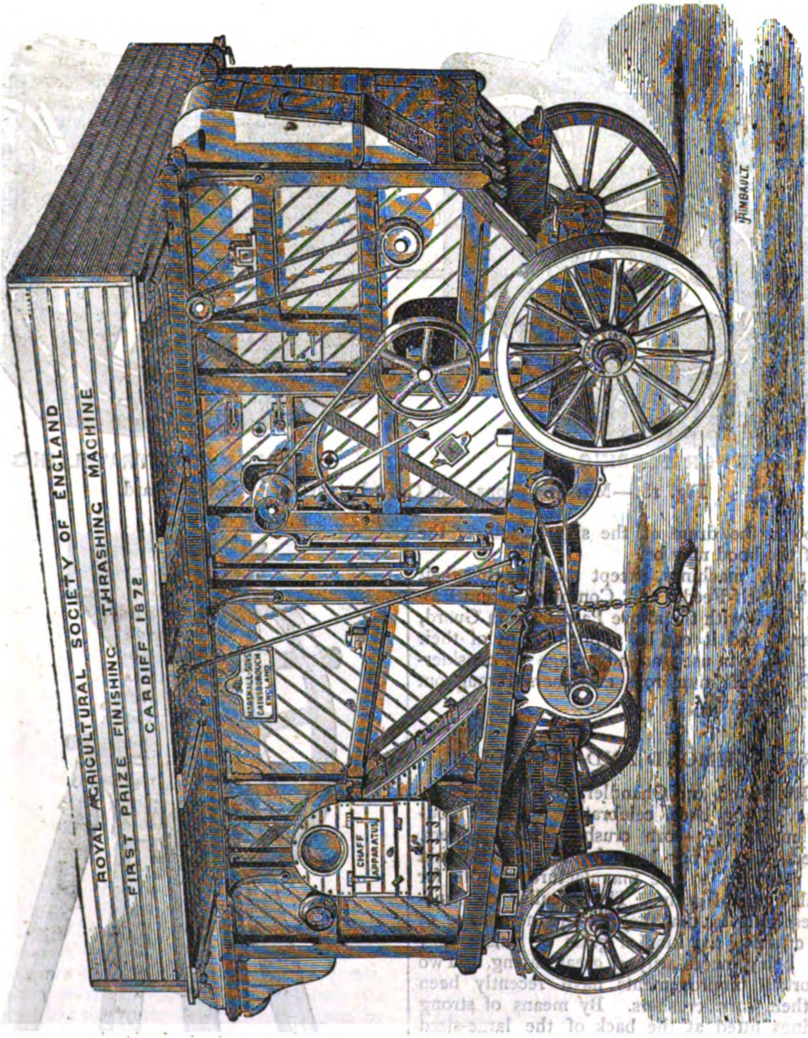

ROYAL AGRICULTURAL SOCIETY OF ENGLAND
FIRST PRIZE FINISHING THRASHING MACHINE
CARDIFF 1872
CHAFF APPARATUS

Fig. 17.—Marshall, Sons, and Co.'s Improved Portable Steam Thrashing and Finishing Machine.

This hood can readily be adjusted to overhang the drum mouth more or less as may be desired, and is fitted with wrought-iron curved end plates sliding in grooves through the top of the machine; these end plates protect the drum at the sides whatever the position of the hood may be.

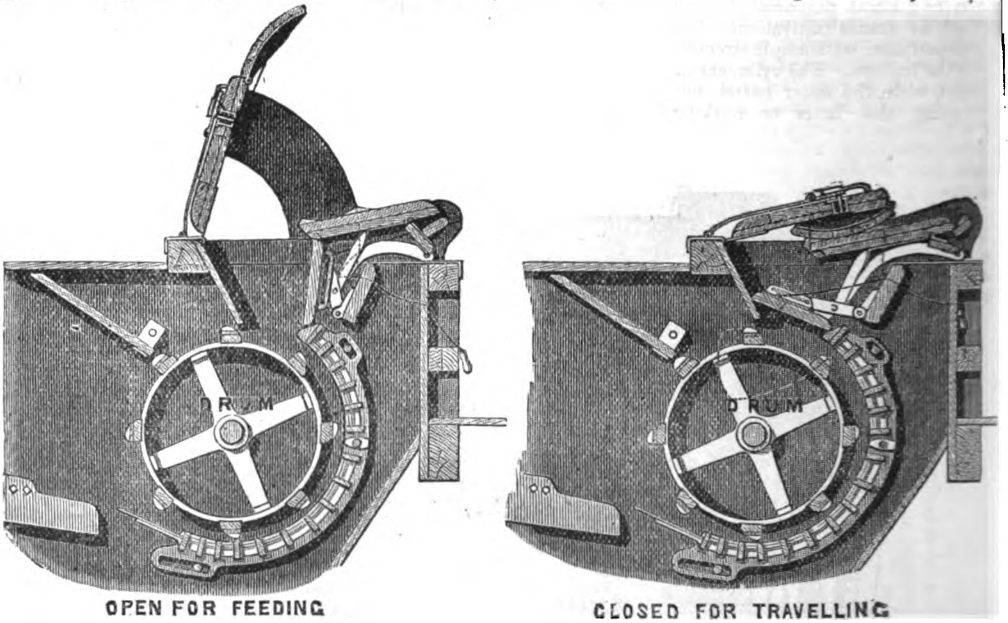


Fig. 18.—Marshall, Sons, and Co.'s Patent Safety Drum Guard.

All their new machines, except those having their Patent Safety Self-Feeder and Combined Drum Protector, are fitted with the above Patent Drum Guard, free of charge, and it can be applied to any of their machines already in use: an advantage of considerable benefit to their numerous customers throughout all parts of the world.

MESSRS RICHMOND AND CHANDLER.

Messrs Richmond and Chandler, of Salford, Manchester, have long been celebrated for their food-preparing machinery—corn crushers, root pulpers, chaff cutters, &c. They have for many years paid particular attention to the manufacture of mills for crushing all kinds of grain. The peculiar construction of these mills is, that they require no change of rollers in crushing any kind of grain or pulse; this, of course, being necessarily a great saving. Two very important improvements have recently been made in their corn crushers. By means of strong spiral springs fitted at the back of the large-sized mills, a great safeguard against accident is established. Should any foreign substance (such as nails, stones, &c.) be present with the grain, the springs allow it to pass through the rollers without either injuring the rollers or breaking the frame or wheels. A sifter is also added, which is very useful in taking dirt and dust from the grain before it reaches the rollers.

Their new "Universal" mill, No. O, illustrated at fig. 19, is, for its size, one of the most efficacious that has been hitherto made, as it will kibble oats, peas, beans, or Indian corn, or will grind them sufficiently fine for feeding purposes, without changing the rollers; the alteration being effected by merely

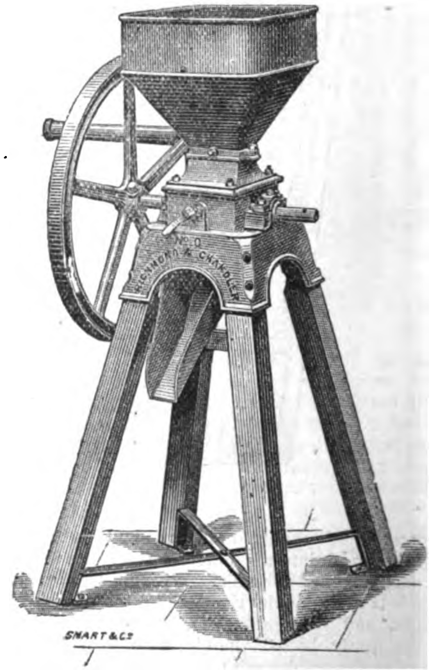


Fig. 19.—Richmond and Chandler's New Universal Mill, No. O.

turning a hand-screw. In construction it is particularly strong, compact, and simple; the frame is of iron, and the legs, which are of wood, are strengthened with wrought-iron stays, which also act as brackets for securing the mill to a floor when required. The bearings are fitted with brass steps, caps, and covers, for the oil holes, to keep out dust. The same care is bestowed in fitting this small mill as distinguishes the larger sizes, rendering it a really servicable addition to any stable where a couple of horses are kept. When taken apart for shipment they pack remarkably close, thus effecting a great saving in freight and cost of cases.

Messrs Richmond and Chandler's chaff cutters have gained high reputation in the class of food economisers at the Oxford trials, under the auspices of the Royal Agricultural Society of England: it was reported by the judges in the *Journal*, "That such veterans as Messrs Richmond and Chandler have little to learn." "No doubt the bearings of their splendid machine (No. 66)," it is added, "were well oiled, and the knives brought to a razor pitch, but other makers were equally attentive to their interests, yet none could produce similar results. Hence we must conclude that the method of gearing adopted by Messrs Richmond and Chandler must be economical." The jurors at the International Exhibition at Paris appear to have entertained the same views as the judges at Oxford, as they awarded the firm a silver medal for chaff-cutting machines. At the Manchester and Liverpool Agricultural Society, held at Liverpool, a silver medal was given to the firm "for superior workmanship, excellence of design, and adaptation of material." Messrs Richmond and Chandler have now fitted their machines with stop-motion, to be acted upon either by hand or foot, and likewise with a self-acting reverse motion. This reverse motion is not liable to clogging or breakage. It is so arranged that the roller and the web are both reversed instantaneously by one movement of a lever; therefore, as soon as the feed is run back, the web carries it away from the rollers, leaving them as cleanly, it may be said, as a new pin. If a very stupid attendant managed to get his hand into the rollers, the reverse action would free it before much harm was done. At fig. 20 we give an illustration of their patent chaff cutter on four wheels, a useful machine, excellent in design and construction.

Pulped roots mixed with chopped straw or hay is a nutritive and economical food for cattle, and the root pulpers of this firm are deserving special attention. Fig. 21 shows one of these with the cover removed to show the improved disc. It is a capital machine and can be safely recommended to stock feeders, dairy farmers, and others in want of a good root pulper.

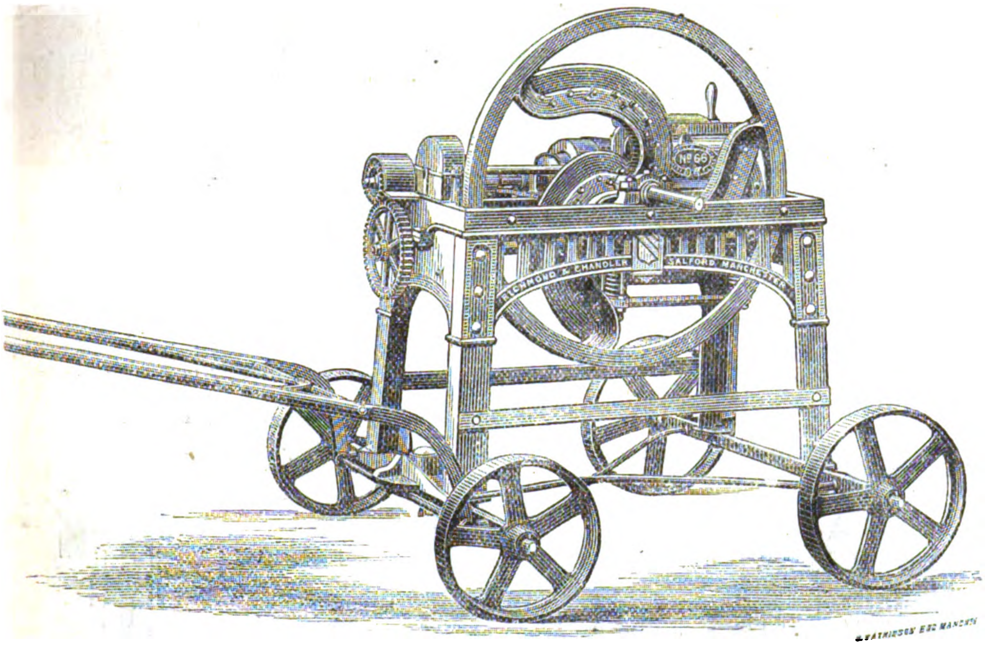


Fig. 20.—Richmond and Chandler's Patent Chaff Cutter, on four wheels.

Where large food-preparing machines are used, and where steam or water are not available to work them, horse power is required. We give an illustration at fig. 22 of an excellent horse-power gear made by Messrs Richmond and Chandler. The construction of this gear is particularly strong, compact, and simple; the frame consists of two castings only, which ensures perfect stability and freedom from strains, caused in other machines of this class from their want of rigidity. The primary motion is obtained by a spur instead of a bevel wheel; thus, though all the parts are of more than usual solidity, the altogether indispensable lightness of draught is at once secured, and is indeed one of the leading characteristics of the machine. The drawing shafts are trussed with adjustable iron rods, and the wheels of the intermediate motion encased. The upright and other shafts are of wrought iron, turned true to their bearings, and fitted throughout with brass steps. Including intermediate motion, joints, and shafts.

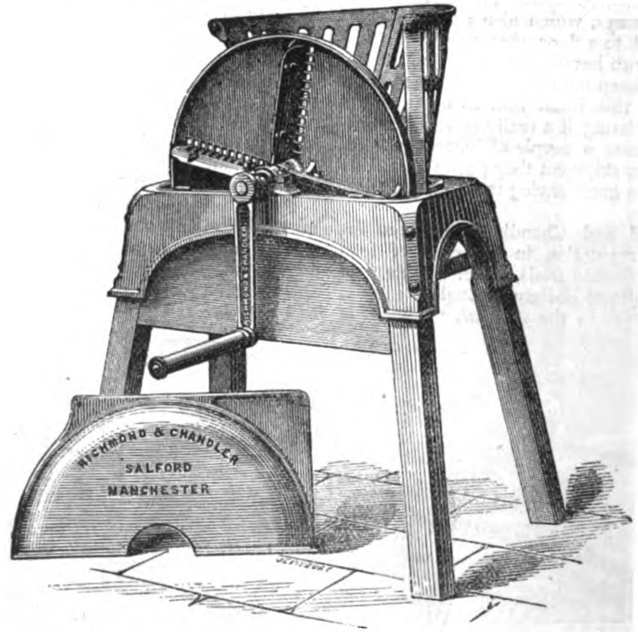


Fig. 21.--Richmond and Chandler's Root Pulper—Uncovered.

Fitted with patent safety clutch, which causes the poles to stop immediately the horses cease to pull.

This gear was awarded the latest prize offered by the Royal Agricultural Society of England, namely,

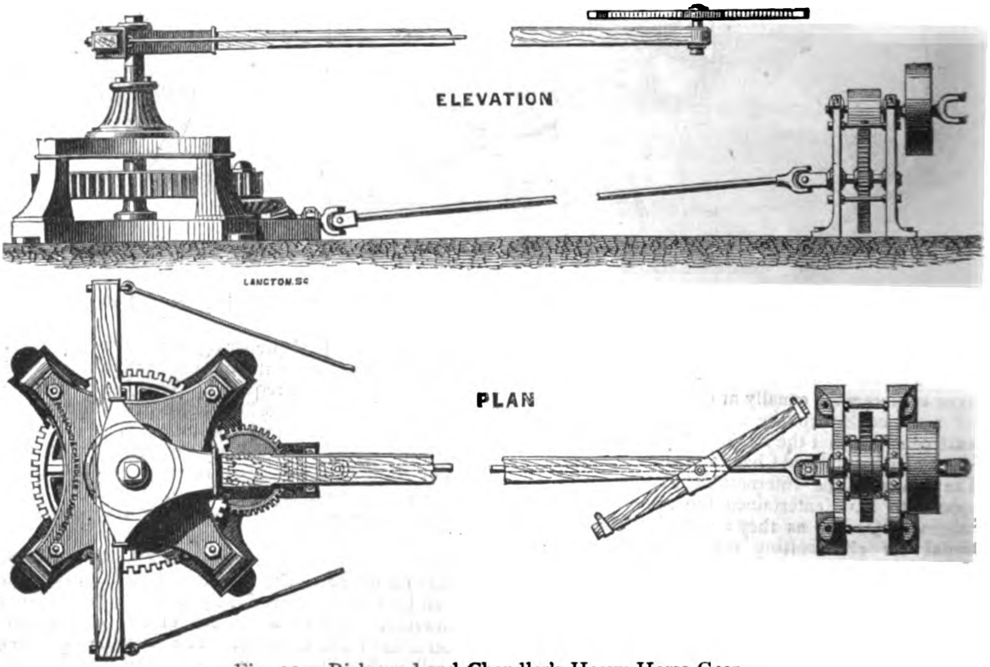


Fig. 22.—Richmond and Chandler's Heavy Horse Gear.

at Oxford, and is described in the Official Report on the Trials of Implements (see *Journal of the Royal Agricultural Society of England*, Vol. VI., Part II., No. XII., p. 466) as "a well made gear, running smoothly." A glance at the table will show that this gear gave off 73 per cent. of "useful effect" (that is, percentage of power left available for driving machinery, as ascertained by the dynamometer and friction break), whilst the useful effect given off by gears of other manufacturers ranged as low as 59 per cent. in one instance.

These facts, published by the Society, may be found useful to intending purchasers, enabling them to fix on a gear which, running lightly and smoothly, does not consume the power, but retains it to be applied to its legitimate purpose—the driving of machinery.

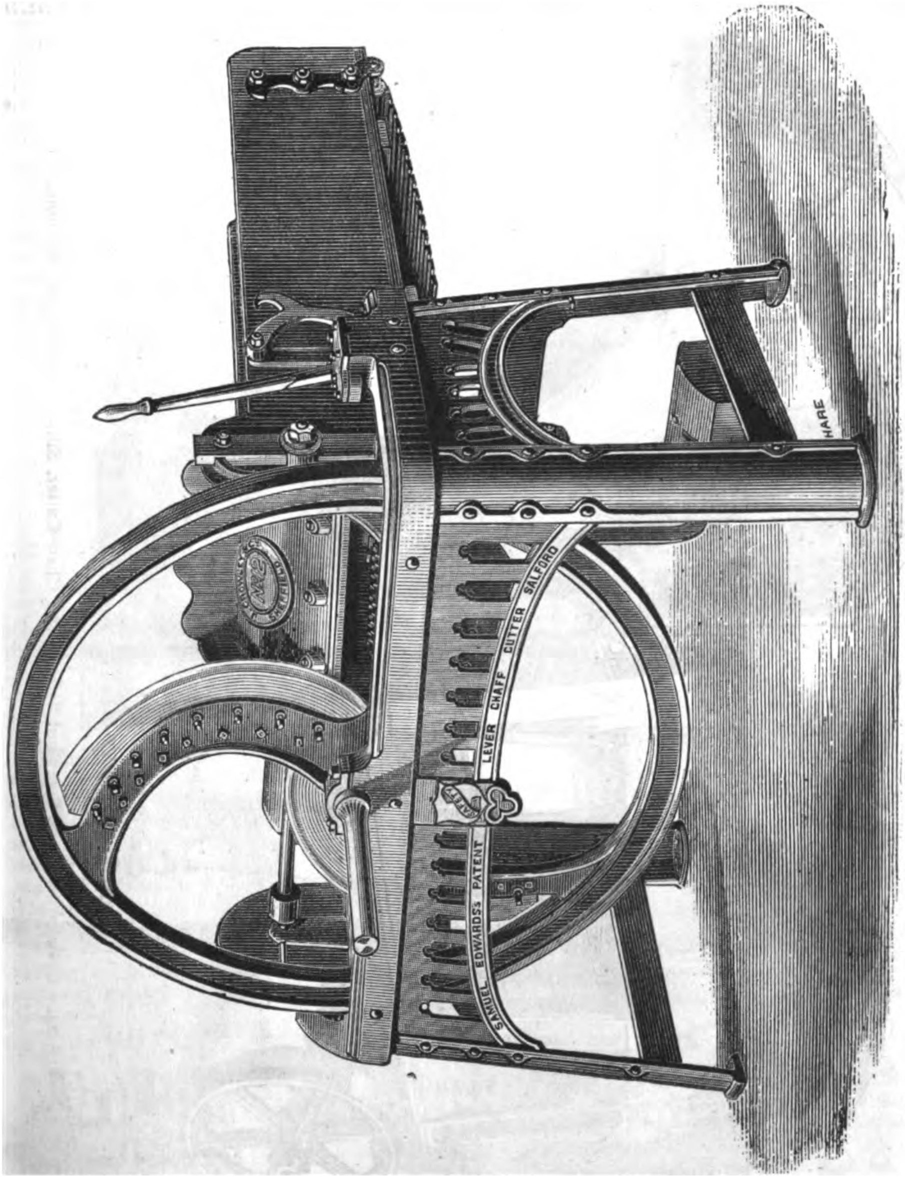


Fig. 23.—Crowley and Co.'s Patent Safety Lever Chaff Cutter (Edwards's Patent).

MESSRS JOHN CROWLEY AND CO.

No chaff cutter is better known, or has gained greater distinction of late years, than Samuel Edwards' patent safety lever chaff cutters, manufactured by Messrs John Crowley and Co., of Sheffield. In England and in France these chaff cutters have been honoured with several gold and silver medals, making altogether upwards of sixty first-prize and special medals since 1874. They were awarded the only gold medal at the Paris Exhibition last year.

The mechanical arrangements of the safety lever chaff cutters are deserving of notice, the whole of the working gear, viz., stopping, reversing the rollers, and varying the length of cut, are under the control of one starting lever. This is a decided advantage over those chaff cutters which require either two handles or a handle and a treadle to perform the above operations. If required, a travelling web or feeding apparatus is fitted inside the hopper of each machine, the action of which web is also under the control of the lever which starts, stops, reverses the feed, and varies the length of the cut, so that the feed-web is reversed or stopped, and the speed varied, by the above lever. The mouthpieces of these machines are composed of hard-run steel, so that the knives are thus kept in good condition. We give an illustration of their patent safety lever chaff cutter (No. 12) at fig. 25. It is the largest chaff cutter made, and is fitted with all the improvements used in the smaller steam-power machines, viz. it stops, reverses, and varies the length of feed by one starting lever. This machine, running

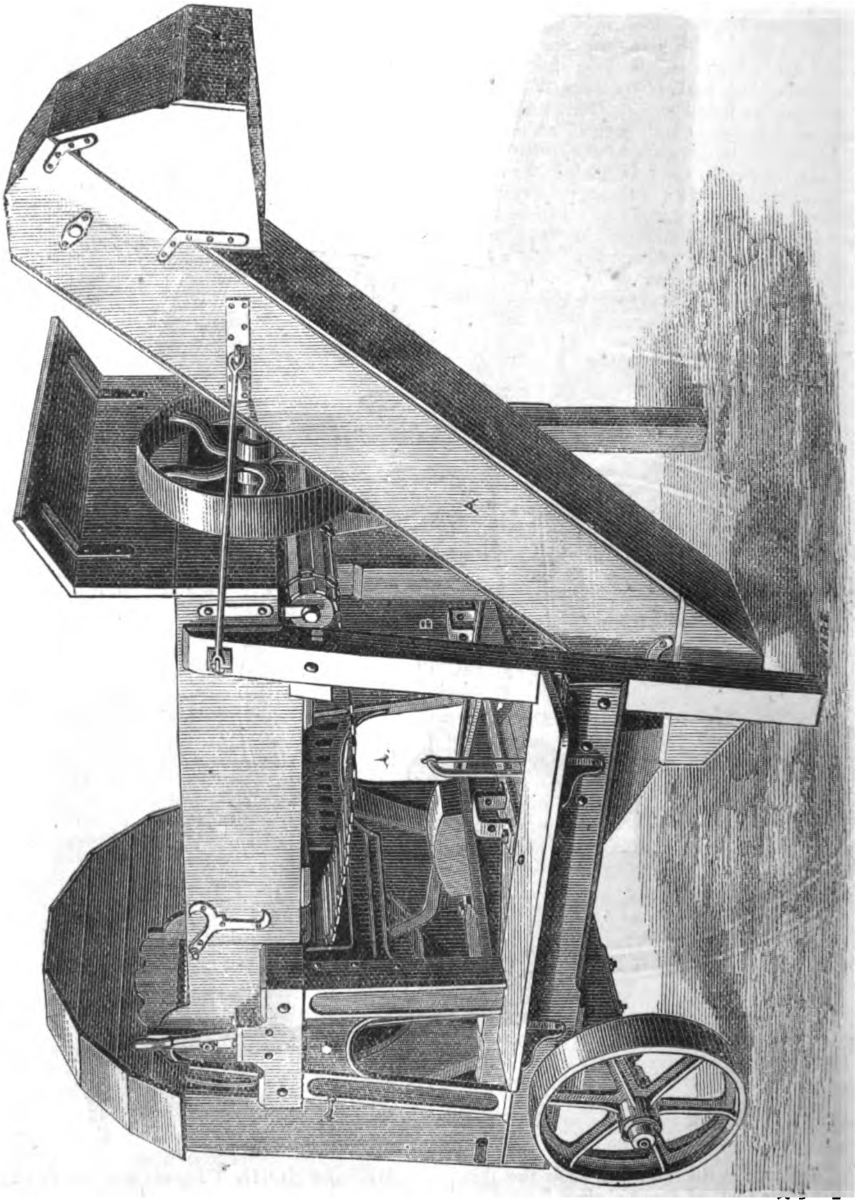


Fig. 24. – Crowley and Co.'s Combined Safety Lever Chaff Cutter, Sifting, and Bagging Machine.

at 200 revolutions a minute, will cut upwards of 4 tons of ⅜ chaff per hour.

The combined safety lever chaff cutter, sifting, and bagging machine (fig. 24) will no doubt meet the requirements of those farmers who desire to cut and sift the chaff, and at the same time bag it for stowage, &c. This machine has a strong frame, mounted on wheels for travelling, and is fitted with the new patent feeding apparatus inside the straw-box, for bringing the feed forward to the rollers. This feeding apparatus or web is under the control of the stop lever, which lever also reverses the feed-rollers, brings back the feed, and changes the length of cut; thus two lengths of chaff can be cut, sifted, and bagged without any change of wheels. The lever is so constructed that no accident can happen to the man feeding the chaff-cutter. The arrangement for bagging the cut chaff is at the end of the machine, and not at the side, as is usually the case. This plan is very convenient, inasmuch as it gives more working space to the man feeding, and takes the cut chaff well away from the uncut straw. The fly-wheel has four knives, and can be changed, if required. The chaff-cutting portion of the machine is made of iron, and the fly-wheel shaft runs in gun-metal bearings. When travelling from place to place, the elevator (A) can be taken off and put on the top of the machine, and the shafts put into the iron brackets (B), which are provided with pins to keep them firm. The weight of the machine is so balanced that it is almost entirely off the back of the horse when travelling.

The "Invincible" lawn mower (see fig. 25), another of Samuel Edwards's patent, is another machine manufactured by Messrs Crowley and Co., worthy of attention. In this machine all systems of mowing can be accomplished, whether English or American, and at the same time no useful feature has been omitted: for instance, the wood rollers can be taken from the front of the cutters and placed behind, if required to cut long or wet grass. The back, or curved plate, can be taken away from behind the cutters when it is desirable to scatter the cuttings on the lawn. The horse-power "Invincible" lawn mower is capable of mowing a great area of ground. It is powerfully constructed, and has all the improvements the smaller ones have, and at the same time every care has been taken to avoid weakness in the general construction, and undue friction when in work. It is quite possible to cut grass 6 inches long clean off at one operation with this machine. It is done by placing the long wood rollers behind the cutters, at the same time removing the small ones from the sides to the front of the machine, thereby taking off all pressure from the uncut grass. By means of a lever the grass box can be emptied on either side of the machine whilst in work. It has three driving rollers, which does away with a great amount of friction when turning the machine round.

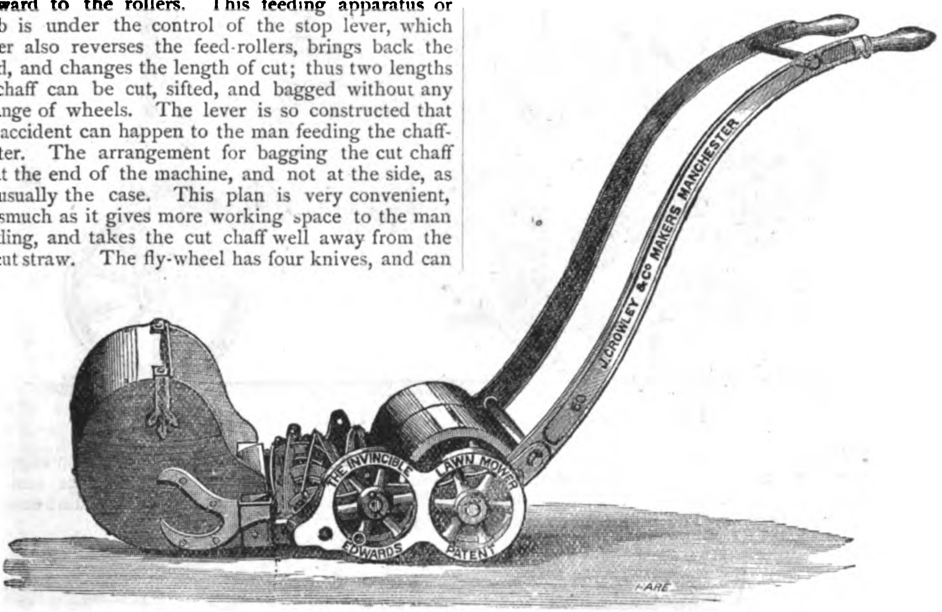


Fig. 25.—Crowley and Co.'s "Invincible" Lawn Mower.

THE READING IRON WORKS, LIMITED.

In the design and construction of agricultural traction engines the aim of the Reading Iron Works, Limited, has been to produce an engine (fig. 26) specially adapted for working thrashing and other farm machinery, and which should be available where the ordinary portable engine cannot be advantageously used in consequent of requisite frequent removals. The following are some of the important features in these engines:—The boiler is of ample capacity and of the best materials, and the firebox has a circular crown and is strongly supported by screwed stays. All the working parts liable to strain are made of extra strength. The cylinder is steam jacketed and constructed to carry the reversing shaft, safety valves, and water filler, by which the number of holes in the plates is lessened, and the strength of the boiler undiminished. The crosshead is of the hammered scrap iron, and forged in one piece with the piston rod. The main bearings of the crank shaft are carried in a wrought-iron plate frame securely bolted to the boiler, and the driving gear is extra strong and has both quick and slow speeds, with hand levers for throwing in and out of gear. The travelling wheels are of increased diameter and width, and suited to hard or soft ground. The steering arrangement is simple, handy, and efficient, and a powerful brake is attached to each engine.

The proprietors of the Reading Iron Works, Limited, are well known for the superior excellence of their thrashing machines. Fig. 27 represents a 3-horse power thrashing machine as packed for travelling. These machines have the highest reputation for clean thrashing, non-liability to injure the straw, easy working, and the large quantity of all kinds of grain they will thrash. The improvements introduced several seasons ago have still further added to the repute in which they are held, viz.:—a wrought-iron drum with patent ribbed beaters and steel spindle, wrought-iron wired concave (similar to those of the steam thrashing machines), and a simple arrangement by which three different speed pinions can be used on the drum, so as to increase or diminish the speed according to the condition or kind of grain to be thrashed. The ease with which the machine runs in consequence of these improvements is very remarkable—about 25 per cent. of additional result is obtained from the same exercise of power.

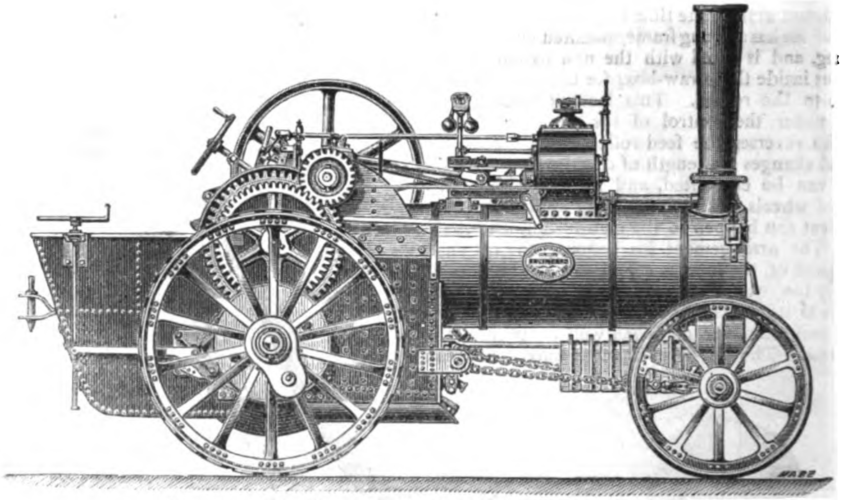


Fig. 26.—The Reading Iron Works' Traction Engine.

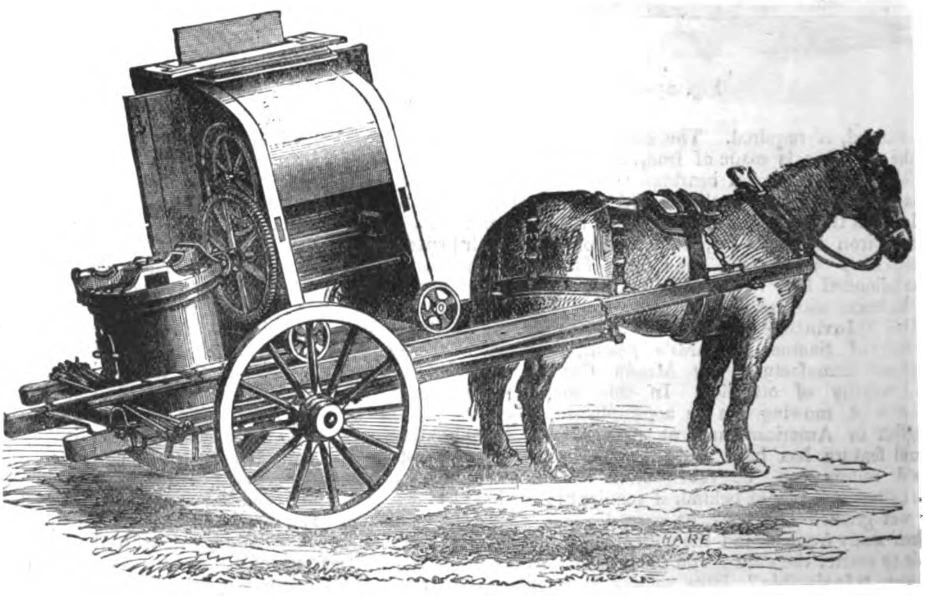


Fig. 27.—The Reading Iron Works' Three-horse Power Safety Thrashing Machine.

The patent "Lock" horse rakes of this firm are deserving of particular attention (fig. 28). The travelling wheels of these rakes are of wrought iron, 3 feet 6 inches high. The whole rake is essentially strong, the spokes of the wheels, from their construction, cannot possibly work loose, by which a grave fault found to exist in the wheels of many rakes is overcome. The axle is of solid wrought iron, and runs through the entire width of the rake, by which a wide bearing is obtained for the wheels and steadiness in work is ensured. The leverage is so placed that the lever or discharging handle is within the reach of a boy. The teeth are of steel of an improved **I** section, tapered, combining great strength with lightness, and the set can be regulated at pleasure, by means of a screw handle attached to a rocking bar, which raises the teeth so as just to skim the ground when raking corn, or sets them deeper into ground for raking hay, &c. Each tooth is fixed on a separate ferrule and acts independently, rising and falling according to the inequalities of the ground, while the whole are so firmly locked when in work that it is not possible for them to rise until it is desired to unload the rake. Any tooth can be instantly removed or replaced in the field.

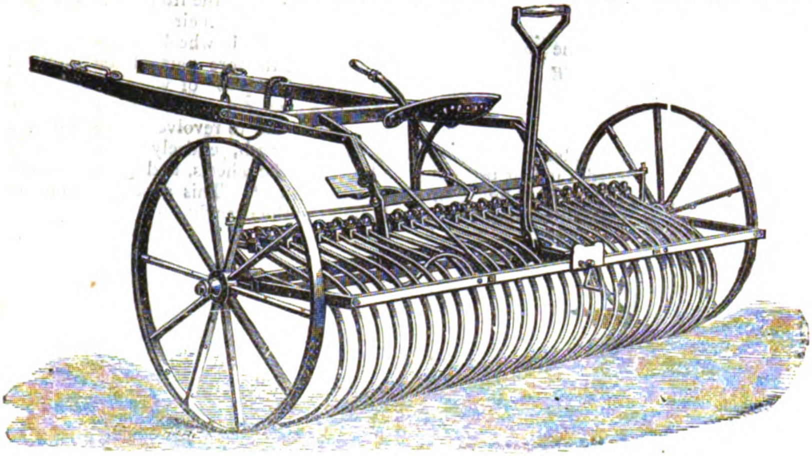


Fig. 28.—The Reading Iron Works' Patent "Lock" Horse Rake.

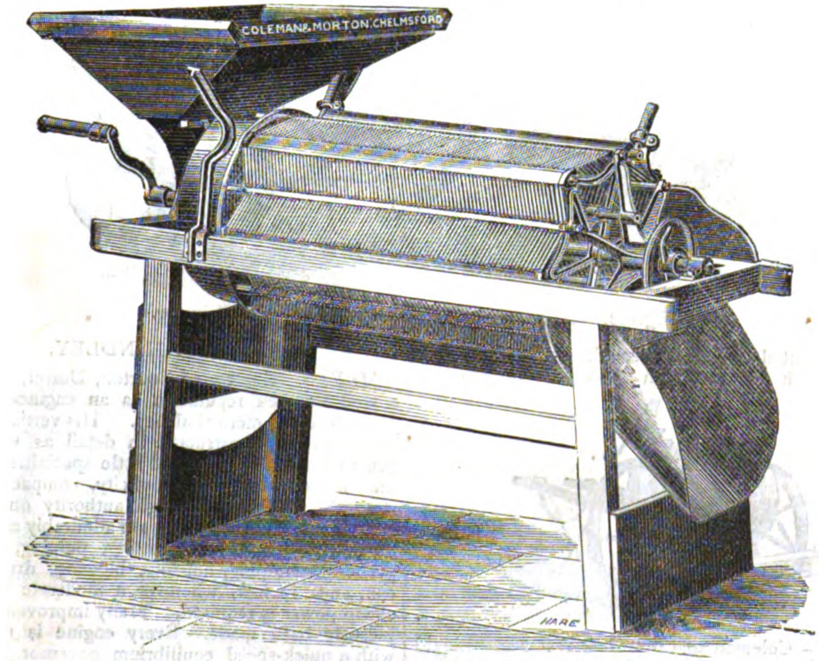


Fig. 29.—Coleman and Morton's Patent Adjustable Rotary Corn Screen and Seed Separator.

MESSRS COLEMAN AND MORTON.

At fig. 29 we give an illustration of the patent adjustable rotary corn screen and seed separator of Messrs Coleman and Morton, Chelmsford. These screens are very popular with maltsters, brewers, merchants, and farmers, wherever tried. The rotary corn screen is so constructed as to ensure efficiency and rapidity of work. The screening parts are made of steel, with a view to greater durability. It may be adjusted to all seeds, from wheat to turnip or clover. It removes dirt and small corn from the good, taking out the thin kernels and thus equalizing the sample. The angular wires being in short lengths and not continuous, one or more can be taken out and replaced without trouble.

Messrs Coleman and Morton's water and liquid manure cart, to which was awarded the first prize at the Paris Exhibition, 1867, is illustrated at fig. 30A. The body is of wrought iron, with strong cast ends, and is mounted on broad wrought-iron wheels. It is fitted with a pump, with gun-metal valves and seatings. It is also fitted with an improved distributor through which the liquid manure passes freely, and which can be readily removed when the cart is required simply as a water-cart.

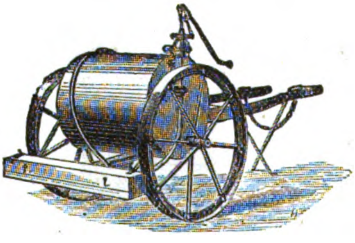


Fig. 30A.—Coleman and Morton's Water and Liquid Manure Cart.

Messrs Coleman and Morton are also large manufacturers of cultivators. For the implement illustrated at fig. 30, they have received 150 first prizes, including two prize medals at the Paris Exhibition of 1878. They have recently designed and patented a new arrangement for the front wheels of these implements which adds to their steadiness and durability. In place of the single wheel and span iron, or crutch, which support the fore part of the implement, they have adopted a *pair* of wheels, one of which is pinned to a steel axle, the other being loose. The axle is thus made to revolve in a suitable bearing of considerable length, entirely preventing any wear in the bosses of the wheels, and giving great steadiness to the implement. This arrangement also considerably lightens the draught.

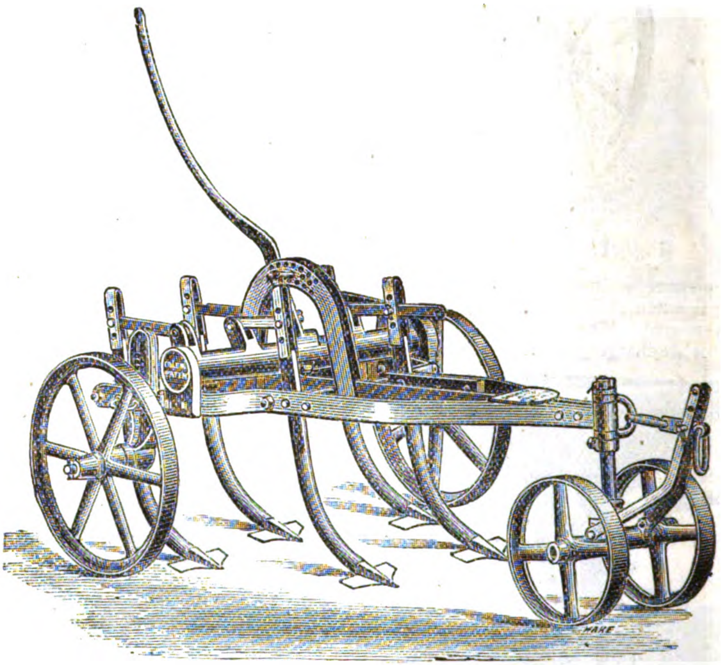


Fig. 30.—Coleman and Morton's Patent Prize Cultivator.

MR E. S. HINDLEY.

Mr E. S. Hindley, of Bourton, Dorset, has gained a well-deserved reputation as an engineer of great scientific and practical ability. His vertical engines are admirably constructed in detail as well as in general design. His useful little specialties are well known everywhere for simplicity, compactness, and strength. A journal of high authority on engineering has remarked that they are admirably adapted for all such work as chaff-cutting, pulping, crushing, grinding, pumping, hoisting, blowing, driving saws, &c., and, in fact, wherever a moderate amount of cheap power is required. Many improvements have recently been made. Every engine is now fitted with a quick-speed equilibrium governor, having an arrangement for attaining any ordinary speed with great uniformity. The reversing of the motion is easily and quickly effected, and there is a marked absence of vibration. One very convenient point about these engines is that they may be reversed, so as to have the fly-wheel on either side of the boiler as desired, an obvious advantage in many instances

They occupy but a very small space, and their management is rendered as easy as is practically possible. Both engines and boilers are made, if required, to travel upon either three or four wheels, rendering them very suitable for removal.

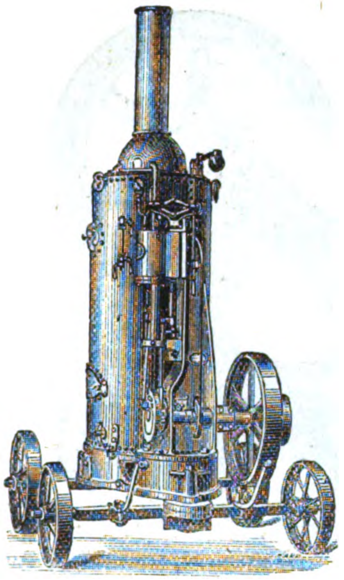


Fig. 31.—Hindley's Vertical Engine.

Another important branch of Mr Hindley's manufacture is the making of saw benches for steam power (fig. 32). The accuracy with which these execute their work, their simplicity of arrangement, their strong and rigid character, and other desirable features of such machines, are prominent in the saw benches of this manufacturer.

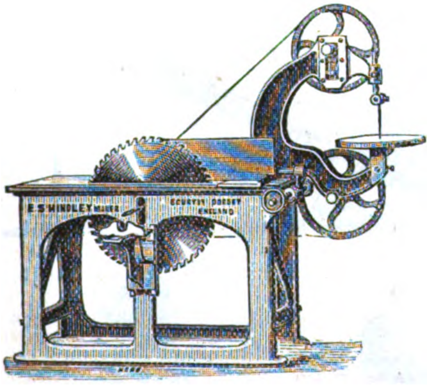


Fig. 32.—Hindley's Improved Saw Bench.

MR ARCHER'S STONE-BREAKERS, AND HIS COMPOUND BONE-BREAKERS AND PULVERIZERS.

The Dunston Engine Works Company, Gateshead-on-Tyne, are the exclusive manufacturers of Archer's patent stone-breakers, and also of his compound bone-breakers and pulverizers, both being excellent machines. The stone-breaker is one of the best known, and is daily coming more and more into use in making road stone. It will do a great amount of work in a given time, and with excellent results as to the material turned out. By the combination of the lever and roller, with corrugations at right angles, it can produce road metal equal to that broken by hand—the flat pieces of stone being cubed by the cubing roller during the upward motion of the lever jaw. The machine will produce road metal without a revolving screen, but screens and elevators are supplied if wanted. (See fig. 33.) The Dunston Engine Works Company also manufacture a combined ore crusher and pulverizer remarkable for strength, durability, and simplicity of construction.

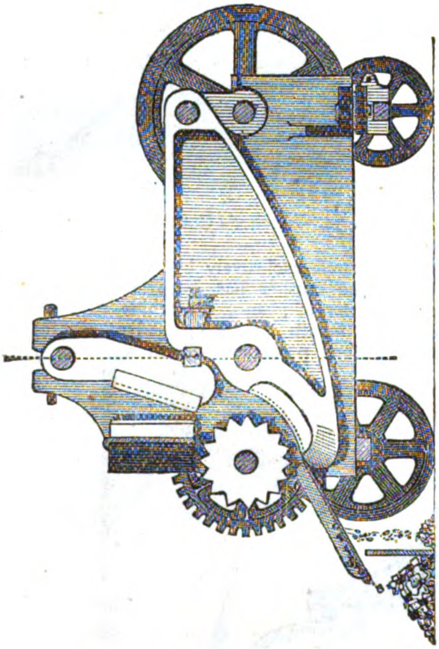


Fig. 33.—Archer's Stone Breaker (Dunston Engine Works Co.)

The compound bone-breaker and pulverizer (fig. 34) is an excellent machine, being simple and effective. It thoroughly crushes the bones into the particular sizes wanted, leaving them in pieces about ½ an inch in size, but by means of a patent balance-lever it can be readily made to crush them smaller. The swing-jaw motion is on the eccentric principle, and while the teeth are satisfactorily doing their special work, the capacious and relentless jaw is assisting them in forcing the broken bones into a spout, which conveys them to the rollers that, in their turn, manipulate them as the attendant deems requisite. Any foreign substances, like iron, is rejected by this machine. With Archer's 20- by 7½-inch mouth crusher, 10 tons of bones can be disintegrated in a day, smaller sizes doing work proportionately in quantity and equal in quality. For greasy or wet bones, a facial roller is added, that, in revolving, carries the bones through the crusher. These machines, it may be mentioned, are manufactured exclusively by the Dunston Co. Archer's bone crusher has been adopted by the largest importer of guano, a machine 20 inches by 7½ inches at mouth having crushed cargoes at the rate of 6 tons per hour. Small sizes are made specially for agriculturists, and are useful for crushing various substances besides bone and guano. The smaller machines are adapted either for hand or steam power.

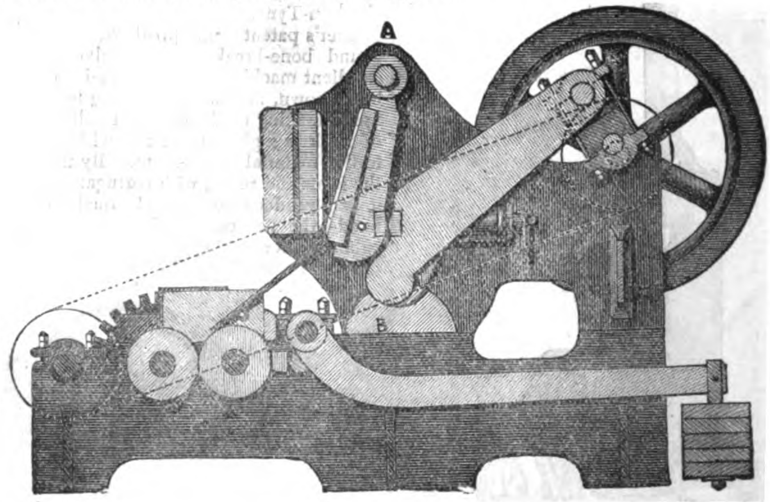


Fig. 34.—Archer's Combined Bone Breaker and Pulverizer (Dunston Engine Works Co.)

MESSRS HARRISON, McGREGOR AND CO.

The "Albion" mower of Messrs Harrison, McGregor and Co., of Leigh, near Manchester, has been before the public for several years, and is highly

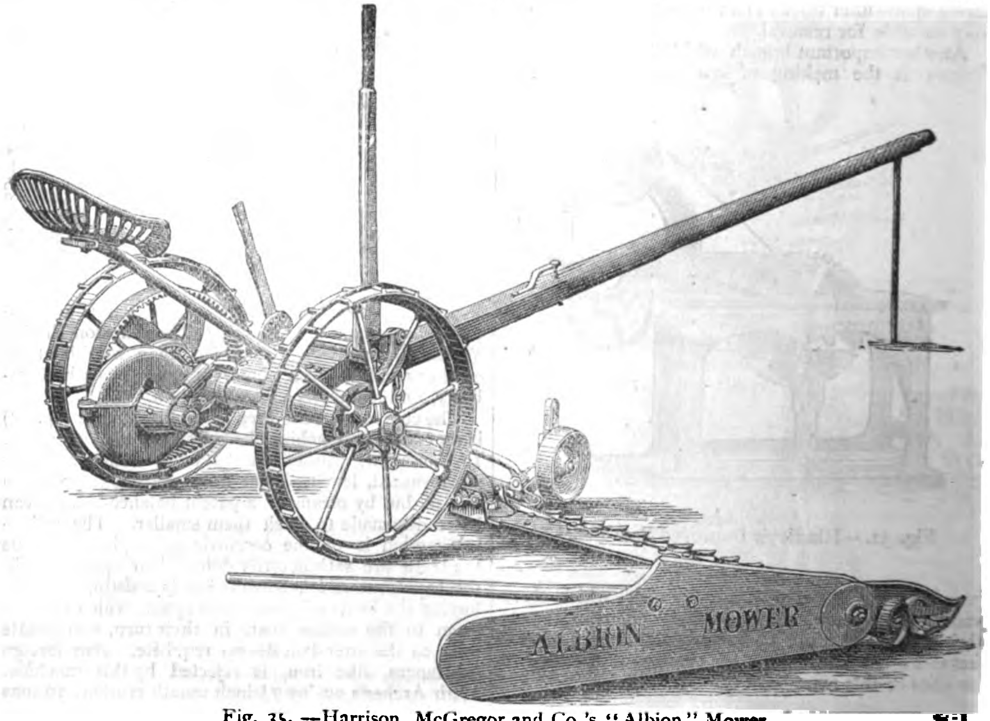


Fig. 35. —Harrison, McGregor and Co.'s "Albion" Mower.

appreciated where used. There have been several improvements embodied in these machines this year, among which may be mentioned a new pattern gear frame, with all the holes for the bushings accurately

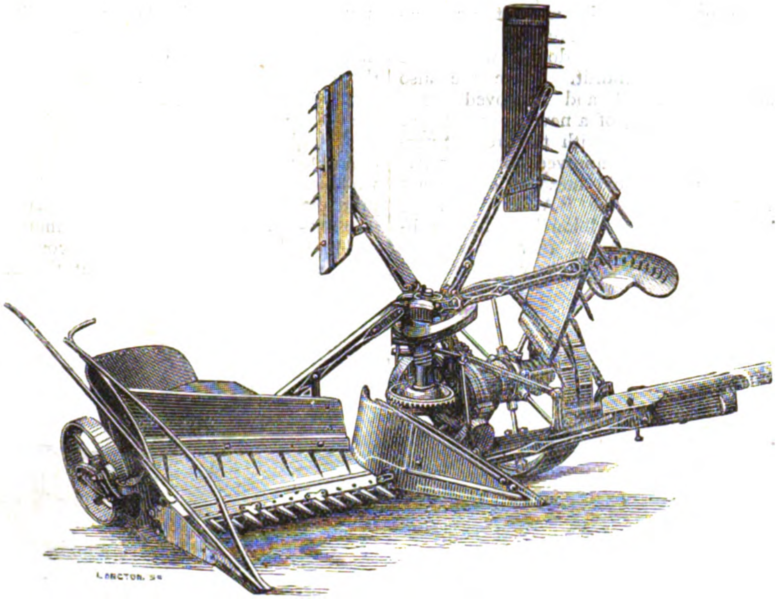


Fig. 36.—Harrison, McGregor and Co.'s "Albion" One-horse Self-raking Reaping Machine.

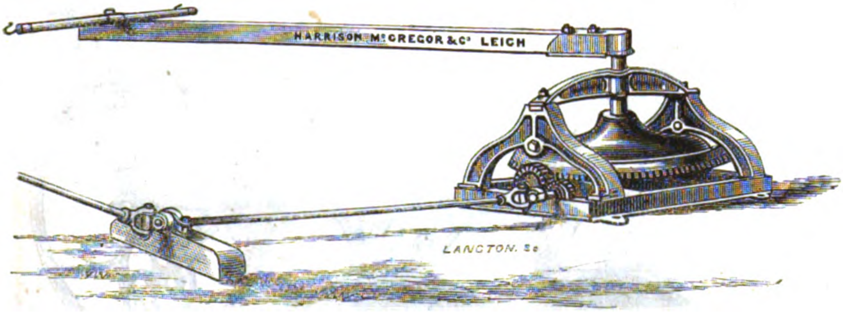


Fig. 37.—Harrison, McGregor and Co.'s New Improved Horse Gear.

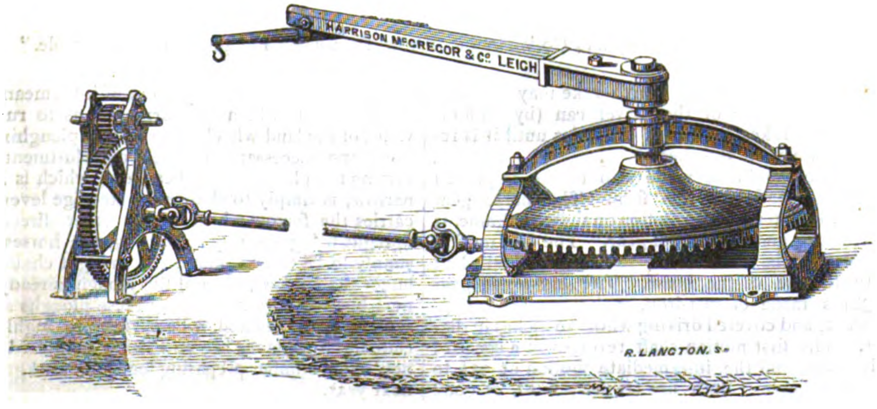


Fig. 38.—Harrison, McGregor and Co.'s One-horse Gear.

bored by special machinery; an improved malleable iron mowing shoe; and an improved knife heel holder, with spring stop or catch, enabling the knife to be changed instantly without unscrewing nuts or bolts, and also preventing the connecting rod from dropping down when the bar is turned up for transit. There are also a new balance crank wheel and improved steel-lined malleable iron fingers, of a new open pattern, combining a perfect shear cut with the greatest possible strength, while their improved form renders them less liable to clog in old meadow or difficult crops. Fig. 35 represents the "Albion" mower, and fig. 36 the new patent "Albion" one-horse self-raking reaping machine, with a new controllable arrangement, whereby every rake, every second rake, every third rake, or every fourth rake may be made to deliver the sheaf; or the driver can (by his foot) cause all the rakes to act as dummies until it is required to sweep off the sheaf.

Reference should be made also to the improved horse gears made by this firm. The horse gear (fig. 37), with intermediate motion on the same frame, is a very strong and substantial gear. The first motion shaft makes six revolutions, and the ground shaft twenty to one of the horse. The one-horse gear (fig. 38) is made of cast-iron, with wrought-iron upright shaft, and covered driving wheel 36 inches in diameter. The first motion shaft revolves at a speed of nearly seven, and the intermediate motion at 33½ to one of the horse. Both are strongly built, of good material, and work smoothly and with great ease.

MESSRS DAVEY, SLEEP AND CO.

It is but natural to find, in undulating or hilly districts, agricultural implement makers developing special appliances for the cultivation of the soil in their respective neighbourhoods, differing greatly from those used in the wide plains of the country. Messrs Davey, Sleep and Co., of St. Germans, Cornwall, are the manufacturers of ingenious turn-wrest ploughs both single and double furrow. At fig. 39 is shown their Double Furrow Turn-wrest, called the "Invincible." It is made on the well-known balance principle so long adopted for steam ploughs, but possesses many advantages over other reversible or one-way ploughs, not only on account of its durability and facility for changing at the headland, but because the balance is taken out of it by means of the furrow wheel, which is so arranged as to run in advance of the land wheel either way of ploughing. All the change necessary in wheels or adjustments, in reversing the plough at the headland, which is left very narrow, is simply to change the steerage lever, which carries the furrow wheel in the other direction, the draught being entirely self-acting, the horses having simply to be turned round, the draught chain passing under the land wheel, and the plough is ready for the next bout. Large numbers of these ploughs are being sent to New Zealand, where they are highly appreciated. Specimens are now being exhibited at Sydney, and a number preparing for Melbourne great show next year.

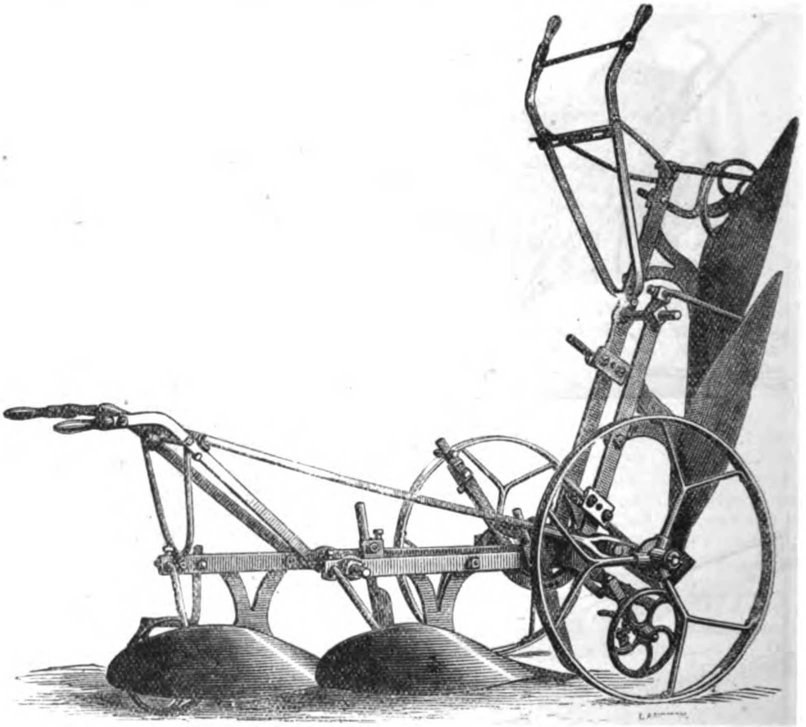


Fig. 39.—Davey, Sleep and Co.'s Double-furrow Turn-wrest Plough, "The nvincible."

At fig. 40 we illustrate a new portable horse rake made by Messrs Davey, Sleep, and Co. Having long since seen the need of horse rakes being so constructed as to pass through narrow lanes and gateways (of which, alas ! there are many), they have for some years past given the matter their close attention, and have this year brought out one on an entirely new principle, for which the inventor, Mr Sleep, has obtained Royal letters patent. The axle consists of three parts, the middle being made of tubular iron and the ends of solid bar iron, made to slide in or out as required. The head of the rake is also made in three parts—the main of which consists of a fulcrum tine bar, made also of tubular iron, and carries bracket arms, extended forward to take another tubular bar, to which the tines are hung. The extreme width of rake, when in working position, is 10 feet 6 inches, and yet, by simply moving two set screws, the two ends can be instantly taken off and the axles slided into the middle tubular part, thus contracting the wheels, so as to pass through a 7-feet gateway.

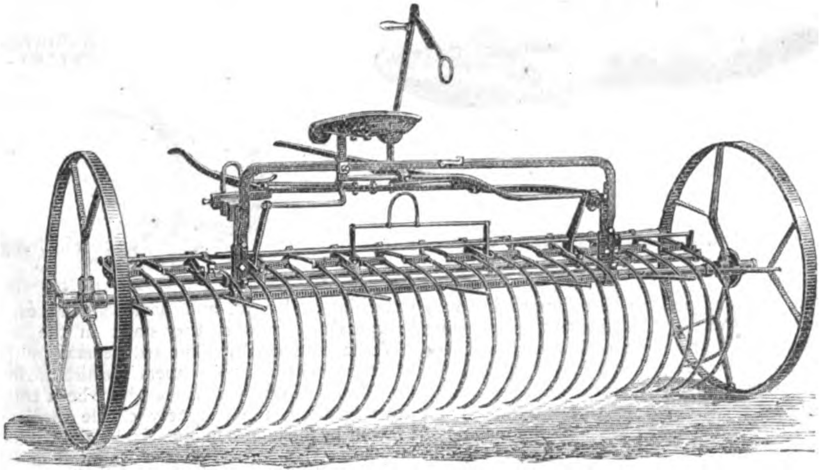


Fig. 40.—Davey, Sleep and Co.'s New Portable Horse-rake.

There are three kinds of leverage—one for walking, and two for riding, viz., one foot, and one hand—which is perfectly self-locking, and so easy and effective that a lad twelve years of age can work it efficiently. For the purpose of putting on or taking off the adjustable ends, for expanding or contracting the rake, a standard is used, having a wide foot and a forked head, which is placed under, and receives the back end of shaft, the foot standing forth at a given angle; the horse is moved a step forward, and the standard assuming a perpendicular position, raises the wheel sufficiently high to effect the change, which is the work of only a few minutes. The rake will gather hay, and rake arish and couch. A special arrangement is made for sheaf-gathering, and has this year kept from eight to ten men binding. The implement is a clever piece of mechanical skill, and reflects great credit upon the inventor.

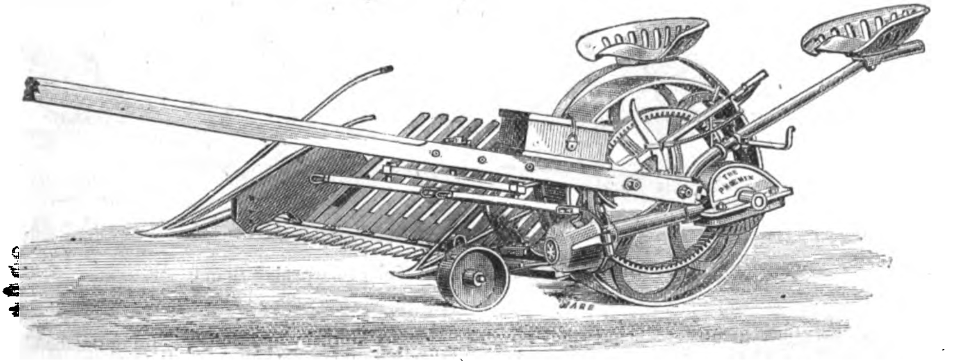


Fig. 41.—John Williams' "Phœnix" Reaper.

MESSRS JOHN WILLIAMS AND SON.

The proprietors of the Phœnix Ironworks, Rhuddlan, near Rhyl, North Wales, have introduced an excellent manual delivery reaper, named after thei own works the "Phœnix." These reapers (a perspective view of one of which is shown at fig. 41), have iron frames, and are fitted with patent clutch gearing, which is self-acting, inasmuch as that when the machine is backed it throws itself out of gear, and is thrown into gear again when the machine is moved forward. The seats are fixed so as to take off all the weight of the pole from the horses. A great feature in these machines is the patent open finger, of which we give an illustration in fig. 42. These fingers are made of the best malleable iron, with a steel lining riveted on (which we illustrate in fig. 43), and has an open space, over which the knife blades pass, so that the knife is freed from all soil and other matter. By this means all tendency to choking is prevented. These machines are made to cut on either side. This firm have also invented a very useful mowing and reaping machine knife-sharpening stand, which will hold a pair of knives combined, and of which we give an illustration in fig. 44. It is a handy affair, and, being very portable, is well adapted for field use.

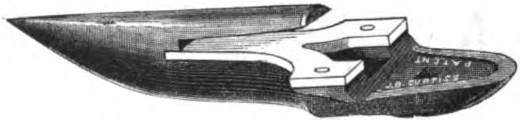


Fig. 42.—John Williams and Sons' Patent Open Finger.

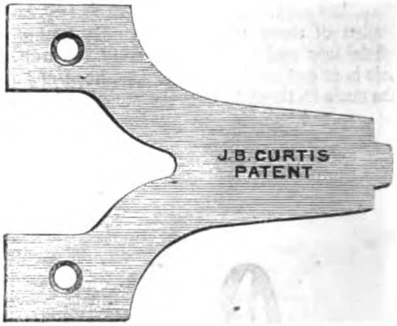


Fig. 43.—The Steel Lining.

Messrs Williams and Sons are also the makers of new patent chaffcutters. These machines are made with three wheels and three bearings less than any other machine, thus greatly reducing the power necessary to work them. They are mounted on circular wrought-iron legs and archplates well braced together. They are fitted with clutch gear to cut two lengths of chaff without changewheels, and they have the stop and reverse motions all on the flywheel shaft. They are fitted with patent feed rollers, so that choking is entirely prevented. The flywheel is fitted inside the frame, and the main shaft works in brass bearings.

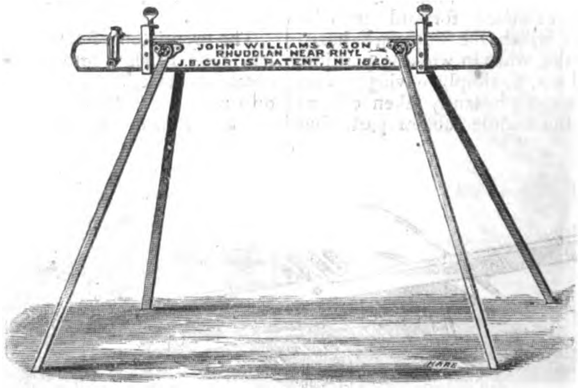


Fig. 44.—John Williams and Sons' Knife Sharpening Stand.

MESSRS HORNSBY AND SONS.

No notices of agricultural implements and implement makers could be complete without mention of the eminent Grantham firm of Messrs R. Hornsby and Sons. As manufacturers of steam-engines, thrashing machines, ploughs, and harrows, and especially in reapers and mowers, they stand in the front rank. We have personally witnessed several public competitions of mowers and reapers in which the implements of Messrs Hornsby and Sons have been engaged, and can testify to the propriety of the verdicts in their favour by the judges in open fields, and without favour; such as those given in the Taunton and Warwick trials of the Royal Agricultural Society.

Messrs Hornsby and Sons' "Spring Balance" self-raker (fig. 45), with five controllable rakes, is made with wrought-iron road wheels of increased diameter, instead of cast-iron, as formerly, and consequent reduced weight of the machine. It is furnished with improved and strengthened controlling arrangements, and a new divider plate bolted to the top of the finger bar instead of underneath, as formerly, enabling the machine to cut lower without pushing the soil before it; and also new patent double-jointed swivel divider wheel, for turning without cutting up the clover crop, and which can be raised or lowered easily and expeditiously, leaving a perfectly clear track. By moving a small handle every third, fourth, or fifth rake may be made to deliver the sheaves, and continue in the same rotation as long as desired, whilst the driver can also, by a lever, cause one or any number of rakes either to deliver the sheaf or pass over it, leaving it untouched. By this means the driver is able to carry forward the cut crop round the corner of the plot, so as to leave room for turning without treading out the standing grain. These changes are made *without any change of gear wheels, or even stopping the machine.* The "in and out of gear" lever is placed in a convenient position. The new reaper is made with five rakes instead of four, as hitherto, as in windy weather five rakes will more effectually gather the crop and keep the knives clearer than four. The arrangement of the crank plate and connecting rod is on an improved plan.

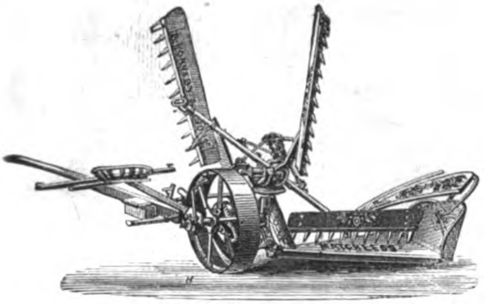


Fig. 45.—Messrs Hornsby and Son's "Spring Balance" Self-raker.

The "Paragon" mower (fig. 46) has a new spring slide for holding the connecting rod in the knife instead of the small bolt and nut, doing away with all loose parts connected with the knife and with the need for using a spanner. Improved leverage for raising the cutter bar, much lighter in lift than formerly. The connecting rod is much improved, being made considerably stronger and more durable. A spring stop is introduced in place of the old joint pin, holding the knife firmly, but allowing it to be taken out instantly without unscrewing any nuts. The crank pin is rendered easy of access, the unscrewing of a simple nut in front of the crank plate setting the rod at liberty. The in and out gear lever is now worked by a slight movement of the driver's foot, without need for him to leave his seat. The finger bar is hinged, so as to be conveniently turned up for travelling, and when turned up is retained by a spring catch. The finger bar can be raised to pass over the swathes. The side-draught is overcome, and the weight of the pole taken off the horses' necks, the direct draught being made even lighter than formerly. All nuts are locked, to prevent them shaking loose. A new pattern frame is used, being stronger, lighter, and more durable than hitherto. The cutting bar is brought more in a line with the axle of the road wheel than before, so as to ride more easily over inequalities of land. A new pattern of double-plated fingers allows all dirt to pass away without liability to clog the knives.

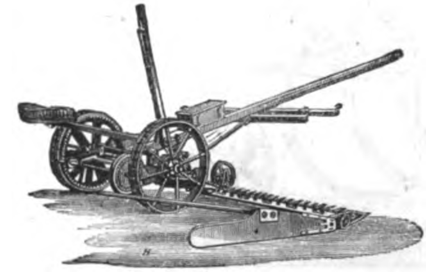


Fig. 46.—Messrs. Hornsby and Son's "Paragon" Mower.

MR W. A. GIBBS' HAY AND GRAIN DRYERS.

The gentleman who for years, at great cost and personal labour, has been trying to make English farmers as nearly as possible independent of the weather when harvesting their crops deserves the thanks of his countrymen. The wet hay and corn harvests that we have experienced of late years has

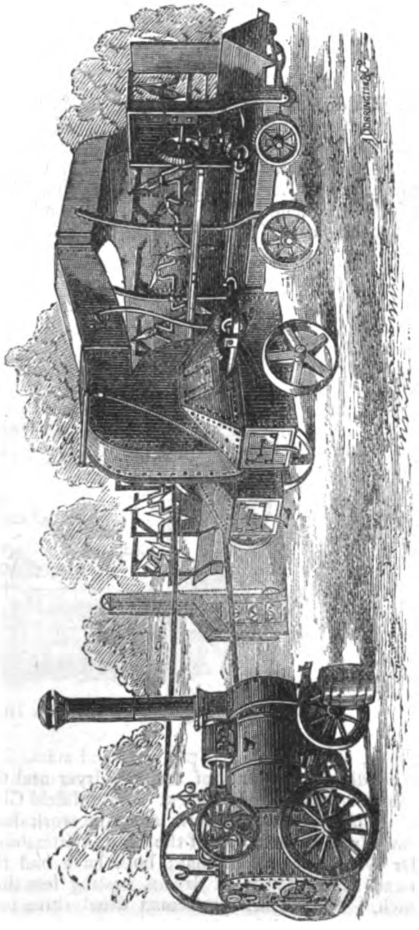


Fig. 47.—W. A. Gibbs' Hay and Grain Dryer.

drawn attention very forcibly to the machinery invented by Mr W. A. Gibbs, of Gillwell Park, Chingford, Essex. They are now coming into prominent notice, as the latest form of hay-dryer has been adopted, amongst others, by the Duke of Sutherland, Sir G. Middleton, Sir William Bagge, &c.; and similar machines, after witnessing practical experiments, have already been ordered for next season by the Duke of Manchester, Lord Ashburton, Colonel Buchanan, and G. J. Fuller, Esq., of Wiltshire. With one of these machines (fig. 47) Mr Ashcombe, of Sewardstone, cleared an acre per hour of grass from the swathe, at a cost of 11s. per acre, and stacked it in fine condition. Models of the hay-dryer and the grain and tea dryer may be seen at the Smithfield Club Show. The very latest reports as to the work done are from Mr William Body, of the Hall, Wittersham, and Dr Ward Proctor, Shifnal; both have had the cheap and simple forms of dryers, costing less than £50 each. The former gentleman dried three tons of wet, coarse marsh-hay in the first five hours of working, the latter 244 sheaves of wheat per hour, or about 5 acres a day.

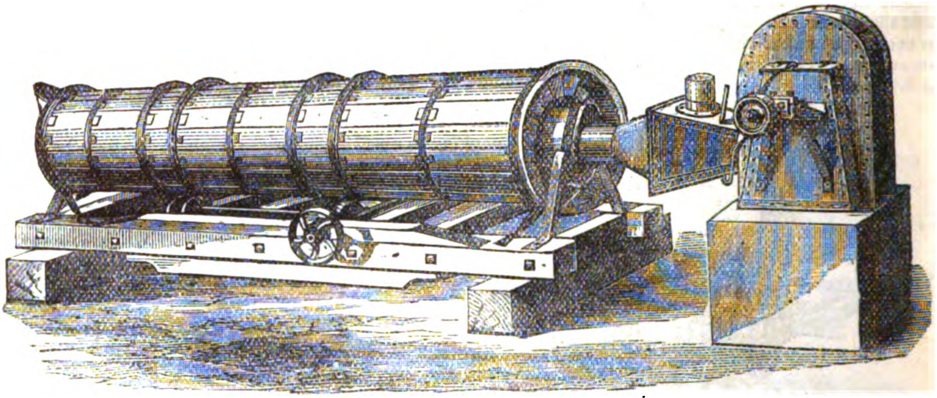


Fig. 48.—W. A. Gibbs' Drying Cylinder.

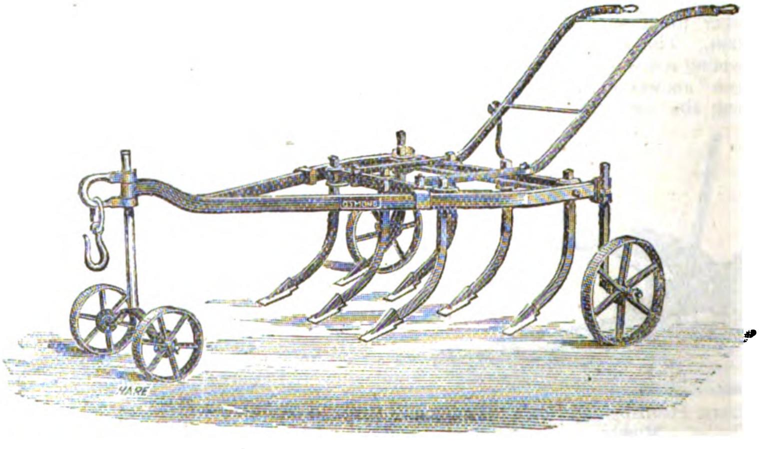


Fig. 49.—Osmond's Improved Cultivator or Scarifier.

The drying cylinder for grain of all kinds, coffee in the pulp or the husk, tea from the rolling mills, or for "withering;" malt, hops, brewers' grains, vegetables for the navy, &c., &c., is represented at fig. 48.

With one cylinder of this construction a company of tea planters realized £600 additional profit in one season. These can be made in all sizes, from £20 to £200 each. The invention is a valuable one to farmers in wet harvests and for the various other purposes indicated. A large illustration of Mr Gibbs's hay dryer in operation is given at the back of plan of the Agricultural Hall, Islington, to be found in another part of this Almanack.

MR S. T. OSMOND.

Water carts are among the specialties to which Mr S. T. Osmond, of Ramsbury, Wilts, pays particular attention as a manufacturer. These carts combine important advantages. Being made entirely of wrought iron, with extra strong ends, there are no bolts or nuts used in the construction of the barrels (with the exception of lid and frame on top), and all brackets for attaching same to shafts or axle are made of wrought iron, thus avoiding leakage and breakage which is so often the case with cast-iron ends. They are fitted with tubular iron shafts, a preventive against injury by exposure to the weather; particularly adapted for warm climates and exportation, as the shafts and axle can be readily taken apart and packed exclusive of barrels, saving the cost of freight. And when fitted with Mr Osmond's patent wrought-iron wheels are among the strongest, simplest, and the most durable manufactured.

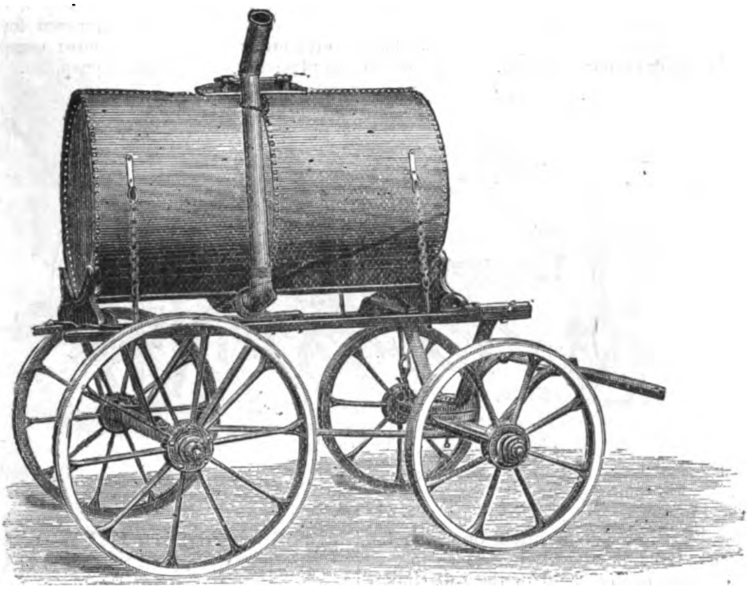


Fig. 50.—Osmond's Improved Four-wheel Water Cart.

An improved cultivator or scarifier is illustrated at fig. 51. This implement is constructed entirely of wrought iron, and consists of two frames working in each other: the outer frame on which the wheels are attached; the other or inside frame carries the tines, working on bearings, with handles fixed for lifting the tines out of work. This plan increases the strength, and renders it less liable to get out of order than those with a single frame. These cultivators are now used by some of the principal agriculturists in Wilts, Hants, and Berks, and give great satisfaction.

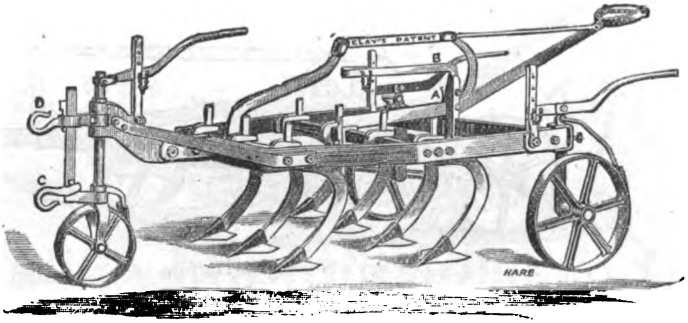


Fig. 51.—Clay's Broadshare Cultivator.

Osmond's improved four-wheel water cart for steam cultivation (fig. 50) is particularly adapted for its purpose. It has a side delivery. The cart is made with extra strong wrought channel iron frame, tubular iron shafts, and, like the others, is mounted on strong wrought iron wheels.

MR CHARLES CLAY.

We were present at the last great trial of cultivators and broadshares at the Hull meeting of the Royal Agricultural Society, and were much pleased with the work done by the implements sent by Mr Charles Clay, of Walton, and the Stennard Works, Wakefield, who entered in all four classes for cultivators, and secured all the four first prizes. Fig. 51 is an illustration of one of these implements, for making which Mr Clay is so celebrated. His cultivators combine in one frame-work the cultivator, the broadshare, and the drag-harrow, or grubber, and they are equally efficient for all those operations.

Clay's patent chisel-harrow cultivator for spring and autumn cultivation is a new implement. It is illustrated at fig. 52, showing its position when at work. They are made of various sizes; the accompanying illustration represents one having a frame 6 feet wide, and four bars fitted with twenty-five wrought-iron teeth that require sharpening only in the same way as ordinary harrow-teeth. The larger harrows are fitted with a patent catch, by which the "pitch" of the points may be altered so as to give the implement more or less held of the soil similar in effect to that of a lever neck in a plough. By loosing the two nuts on the side of the catch under which the main lever fits, the catch may be raised and fixed against there by the nuts. This will throw down the points of the teeth or tines and cause them to enter better when the surface of the land is somewhat hard.

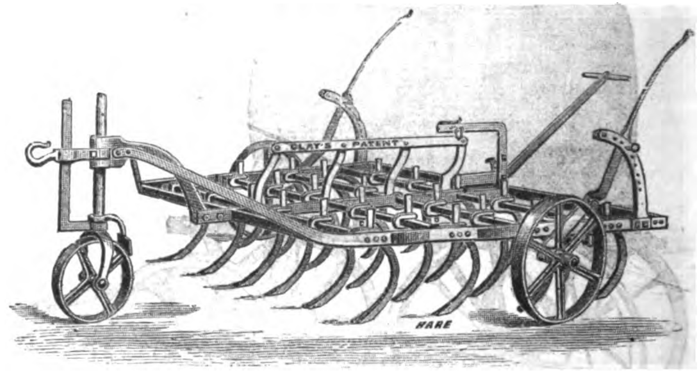


Fig. 52.—Clay's Patent Chisel-harrow Cultivator.

The Norwegian harrow has long been a favourite implement for working rough strong land after it has been broken up by a cultivator or cross-ploughed. Mr Clay has introduced several improvements in it by which the draught has been so far reduced as to bring it within the power of three horses, whilst at the same time the leverage arrangements are much simplified, enabling the man to raise the implement easily out at the ends, thus further reducing the strain upon the horses. The improved form of the spikes (see fig. 53) makes it a most efficient clod crusher and pulverizer, and by the lever and rack the three rows of spikes can be regulated to any height from the ground, so as to press either heavily or lightly upon the surface of the ground as may be required. The harrow is made 5 feet wide, but this may be altered if required to suit purchasers. It is a very efficient implement in its present improved form. The above three implements form a most complete set of field implements for cultivating purposes.

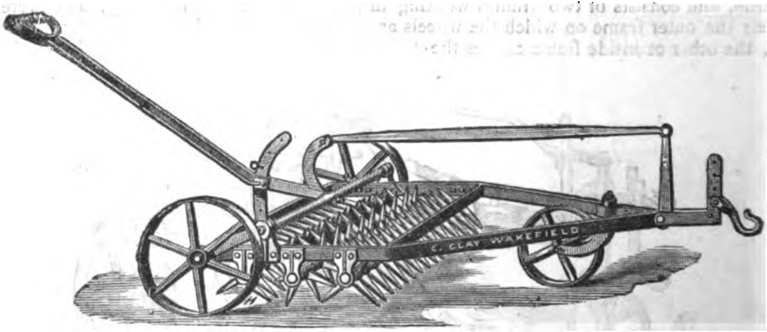


Fig. 53.—Clay's Norwegian Harrow.

MESSRS J. AND H. KEYWORTH AND CO.'S "BUCKEYE" MOWER AND HAY-TEDDER.

The "Adriance Buckeye" mower is a favourite American machine. The agents for it in England are Messrs. J. and H. Keyworth and Co., 35 Tarleton Street, Liverpool. The "Buckeye" is favourably known in those counties of England where it has been used. Like most American machines, the draught is very light, whilst at the same time it is made of strong and durable material. The whole weight of the machine is on the driving wheels, which turn independently on the axle. The cutter bar is carried on its own wheels, preventing inequalities of ground affecting the motion of the knife. The cog wheels are very few. There is entire freedom from side draught, and the machine is adapted to work on all kinds of lands.

The "New York Hay Tedder" is another American implement sold by the same firm (fig. 54). This machine has its reel between the ground wheels, and still teds the grass directly to the back of them, leaving it light and flocky there as elsewhere, and although the wheels are closer together, it teds wider than the old rotaries. The reel is readily and accurately adjusted to the ground surface by a lever handled by the operator in his seat, and when once adjusted requires no watching or raising in ordinary rough places or dead furrows. If an unusual obstruction should be met, the reel can be raised high enough, in all probability, to pass over it without stopping the machine, so great is its range of adjustment. No lever for throwing out of gear while working would be used by the operator in his seat, if there was one. Before mounting, the machine is instantly thrown into gear, and on dismounting, instantly out, if wished. By reason of its pawls and ratchets, it may be backed safely at any time, as the reel is not then revolved.

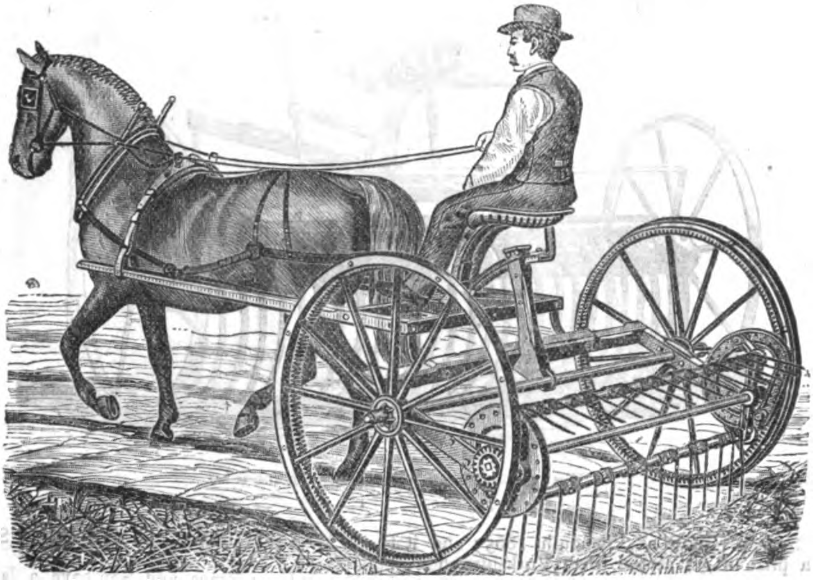


Fig. 54.—New York Hay Tedder (Messrs J. and H. Keyworth, Liverpool).

MR THOMAS ALLCOCK.

Mr Thomas Allcock, of Ratcliffe-on-Trent, Notts, has in the list of agricultural implements manufactured by him, some well-designed horse rakes, constructed with a view to efficiency at work and strength and durability of material. His patent prize horse rake is illustrated at fig. 55. It has been largely in use for the last fifteen years. It is made in

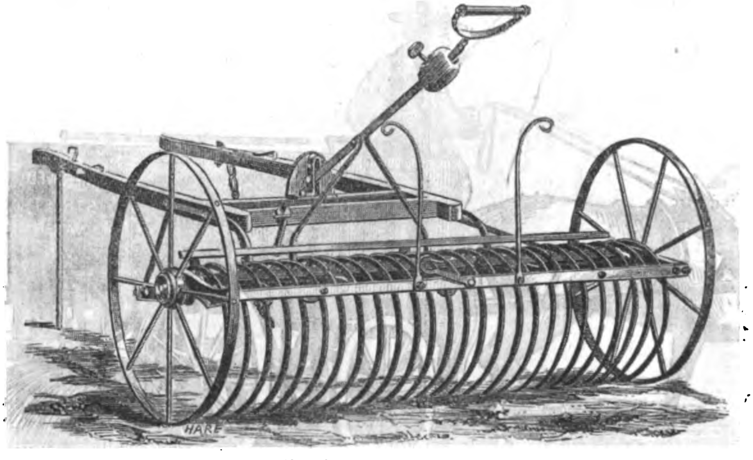


Fig. 55.—Allcock's Patent Prize Horse-rake.

four different sizes, with large wrought-iron wheels. This rake gained a special prize at the North Lincolnshire Agricultural Society's show at Brigg, 1861; it was commended by the judges at the Royal Agricultural Society's show at Plymouth, 1865; and it gained a prize of £2 at the great Yorkshire show, 1865.

Allcock's new improved horse-rake (fig. 56), as will be seen, differs from his original horse rake, and is made with handle and seat for driver, or with handle alone. It is made in three different sizes, with large wrought-iron wheels and solid axle. T leverage is very simple and effective, and the implement bears witness to the ingenuity and workmanship of the makers.

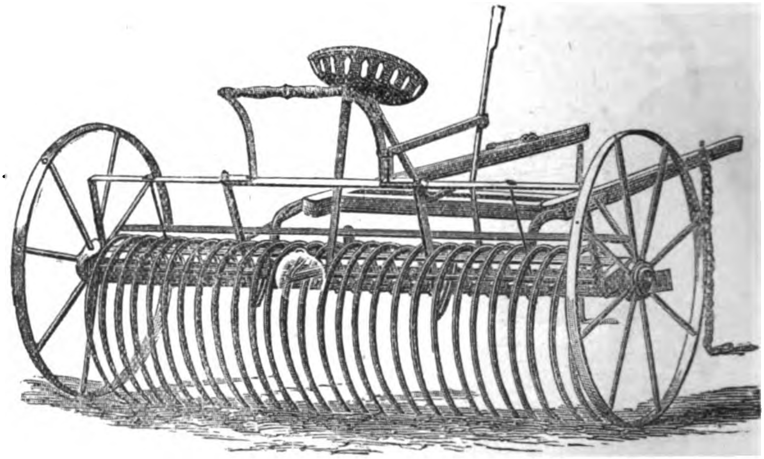


Fig. 56.—Allcock's Improved Horse-rake.

MESSRS ISAAC JAMES AND SON

Messrs Isaac James and Son have a large ment of street water-carts, vans, &c., in their blishment, the Tivoli Works, Cheltenham, with special improvements. They are made of material and of light draught. Each cart or

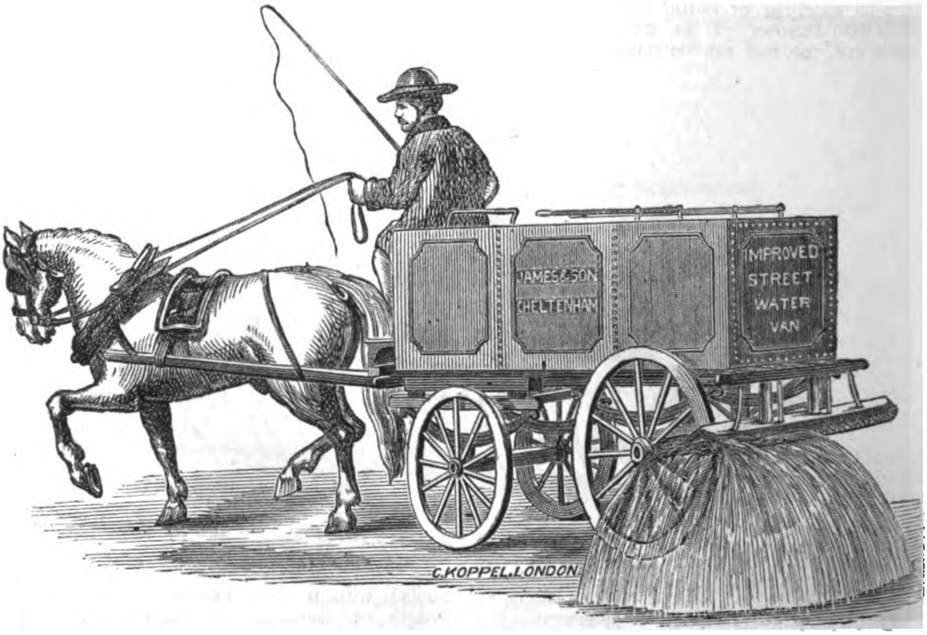


Fig. 57.—James and Son's Street Water Van.

as a double valve and distributor, and either side an be stopped instantly when only half the width of water is required on the roadway, as in passing carriages or narrow spaces. It spreads a fine shower of water at a great breadth when desired, and are fitted with or without double brake as required. (See fig. 57).

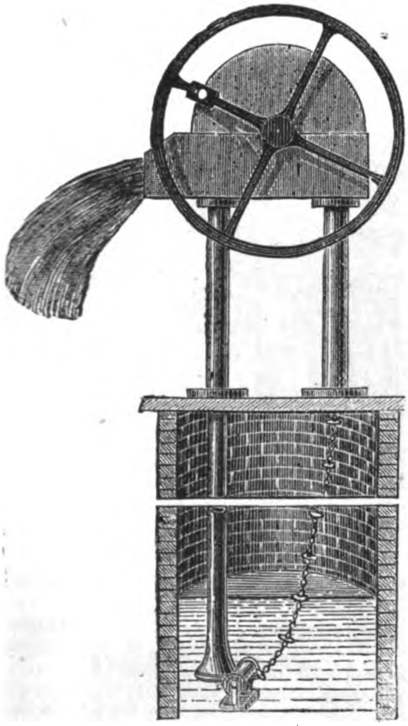


Fig. 58.—James and Son's Improved Chain Pump.

At fig. 58 we give an illustration of Messrs James and Son's improved silver medal chain pumps. The use of the chain pump is found very advantageous in many ways. They have no valves, will pump thick liquids of any kind, and are never affected by frost. Also a larger amount of water can be raised by them than by any other pump of the same power. For the Colonies, and all countries where repairs are difficult, they are particularly adapted. They are especially useful for liquid manure tanks, brick yards, irrigation, &c.

Another speciality manufactured by this firm is an improved bone and stone crusher. The crusher illustrated at fig. 59 is for horse or steam power, and is an invaluable machine for bones, gravel, or concrete. It will take any ordinary size bone and crush it to about ¾-inch, ½-inch, and fine at one working, but it can be made to break stones or concrete any size up to 1½-inch if the size is mentioned when giving the order. It is made strong and durable, and will crush 2 to 4 tons per day, according to the dryness of the bones. It can be worked by four or six horses, according to the nature of the material requiring to be broken or crushed. The same firm are now bringing out a small portable crusher for hand or small power, well adapted for the Colonies, or parties requiring a cheap article for their own use.

MESSRS RUSTON, PROCTOR, AND CO.

Realizing the steadily increasing demand for traction engines, Messrs Ruston, Proctor, and Co., of Lincoln, have of late years devoted special attention to their manufacture, and they have succeeded in producing a thoroughly practical and efficient article, combining as large a number of good points as possible. For farm purposes their traction engine (fig. 60) is eminently adapted: it will drive a thrashing machine, saw bench and grinding mill, ploughing tackle, or a pump for draining or irrigation, and, in fact, any kind of work for which steam power is available. As the working parts are made extra strong, and the boiler suitable for a high working pressure, a very large amount of power can be obtained considerably exceeding the proportion obtainable from the ordinary portable engines. The engine will also move itself with any of the above machinery from place to place, or draw along ordi-

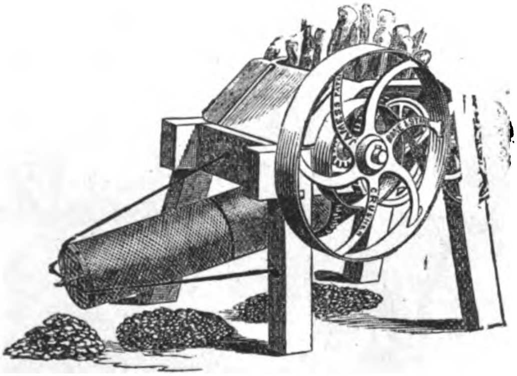


Fig. 59.—James and Son's Bone and Stone Crusher.

nary roads heavy loads of coal, &c., taking them up steep and difficult ascents which would require an inconvenient number of horses.

A novelty worthy of especial notice is Ruston's patent self-acting feeder for thrashing machines. This apparatus is of an entirely new principle; it consists of a chamber or casing at the top of the machine directly over the drum, in which is fixed a large horizontal roller provided with obtuse teeth. At one end of the chamber is a hopper into which the corn to be thrashed is placed, and being drawn by the revolving hexagonal roller into the drum, it is thrashed in the usual manner, a set of rocking teeth being so placed as to split up the bundles and effect an even distribution. A self-acting safety spring-board and disengaging gear are also provided, which

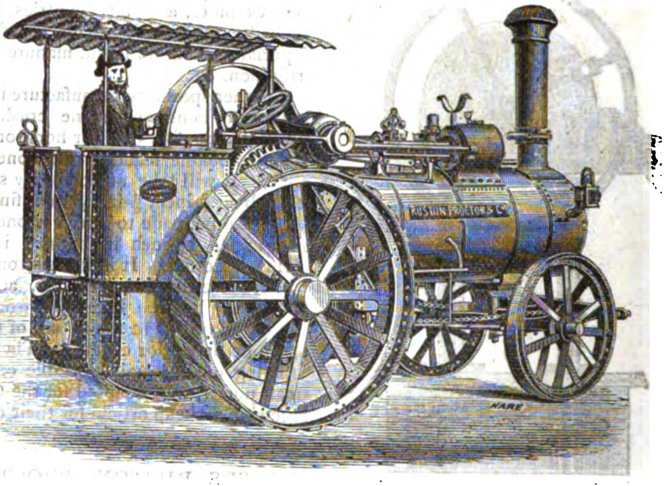


Fig. 60.—Ruston, Proctor and Co.'s Patent Traction Engine.

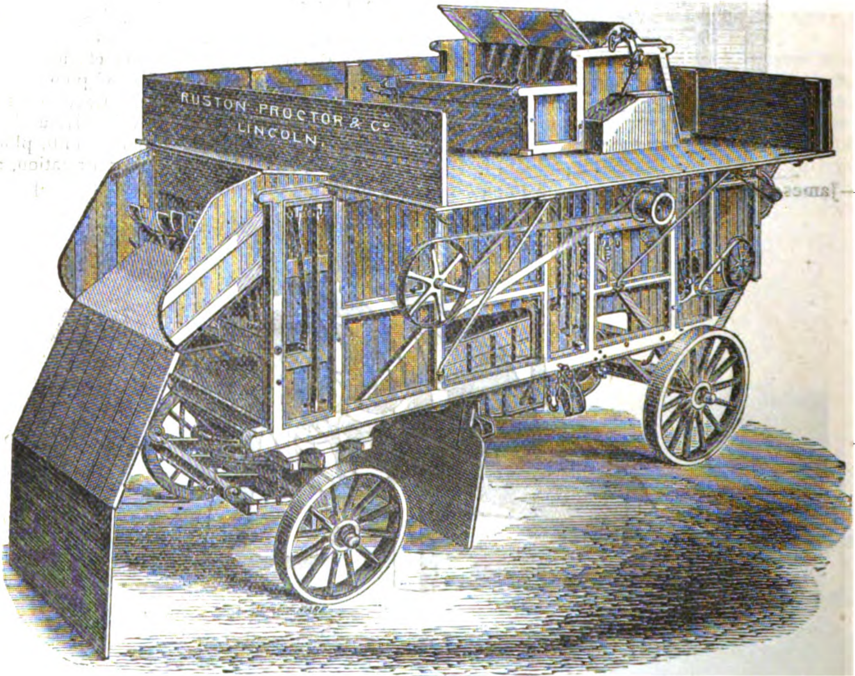


Fig. 61.—Ruston, Proctor and Co.'s Patent Self-acting Feeder for Thrashing Machines.

instantaneously throw the feeder out of gear in the event of any person stepping or falling into it, thereby preventing entirely those unfortunate accidents to life and limb that have so often occurred in unprotected machines. Fig. 61 represents the self-acting feeder fixed to one of Messrs Ruston, Proctor, and Co.'s thrashing machines, and fig. 62 the apparatus separate from the machine.

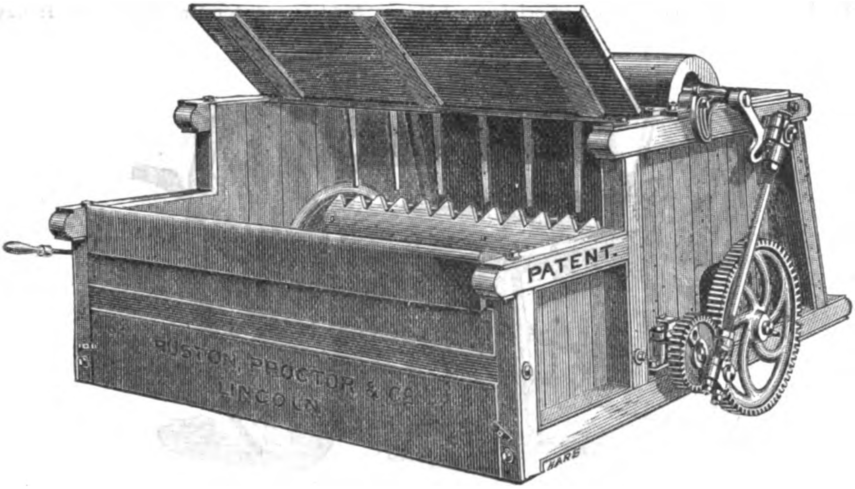


Fig. 62.—Ruston, Proctor and Co.'s Feeder for Thrashing Machinery.

MR W. BRENTON.

The implement makers in the West of England, although more thinly scattered throughout that part of the kingdom than their rivals are in the East, are by no means behind them in ingenuity, constructive skill, or honesty of work. Mr W. Brenton, of St. Germans, Cornwall, has received many prizes for his corn-drills and other public marks of recognition for his implements and machinery. We give at fig. 63 an illustration of one of his Royal Cornwall First Prize Medal Corn Drills. These drills are fitted with wrought-iron levers and hammered coulter stalks with steel points, thus uniting strength with lightness. The levers act independently, and are lifted at the headland by an eccentric frame; just one pull of a lever handle, and all the coulters are raised to any desired height. The seed is discharged by a notched roller, which brings the corn in a regular stream to the openings which are in the side of the box, under the drillman's eye. The openings are regulated by a slide, and adjusted instantly, and the speed of the horses on hill-side land does not interfere with the regularity of the sowing.

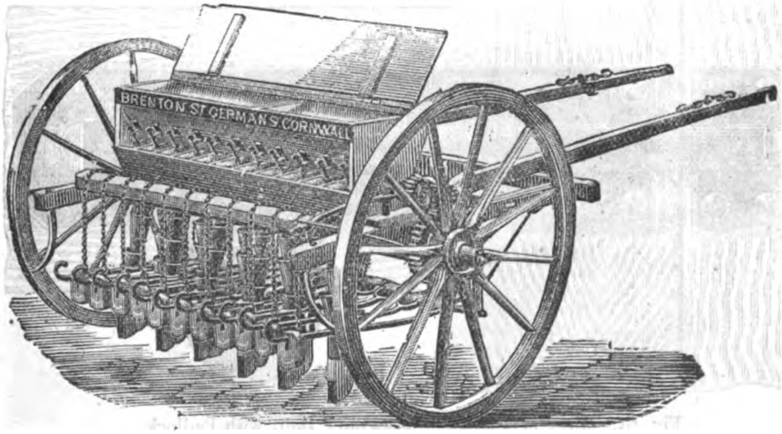


Fig. 63.—Brenton's Royal Cornwall First Prize Medal Corn Drill.

Fig. 64 represents one of Mr Brenton's turnip and mangold drills. They are fitted with independent levers, and will deposit the manure at any distance of depth. The manure box will sow from 2 to 40 bushels of any manure per acre. The manure, admitted through adjustable spaces, falls upon a barrel of chilled metal, by which it is carried over into hoppers and discharged on the ground. A scraper under the barrel prevents clogging.

Mr Brenton has patented an ingenious contrivance in the "lockpin" safety bolt. The principle on which it is constructed will be understood by reference to fig. 65. This newly invented bolt is remarkable for its simplicity, strength, and efficiency. It is an admirable device for securing stable and cattle-shed doors, gates, dwelling-house doors, &c. It is impossible for cattle or other animals to unfasten it; it dispenses with pins and chains, and will not unfasten by any amount of oscillation, and as a door-fastening for the house it is more difficult to pick than any other lock or bolt, being fitted with a stop which prevents the lock-pin being lifted from outside.

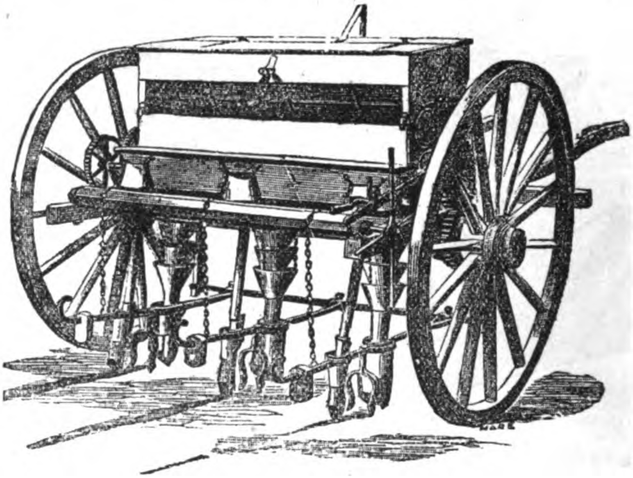


Fig. 64.—Brenton's Prize Turnip and Mangold Drill.

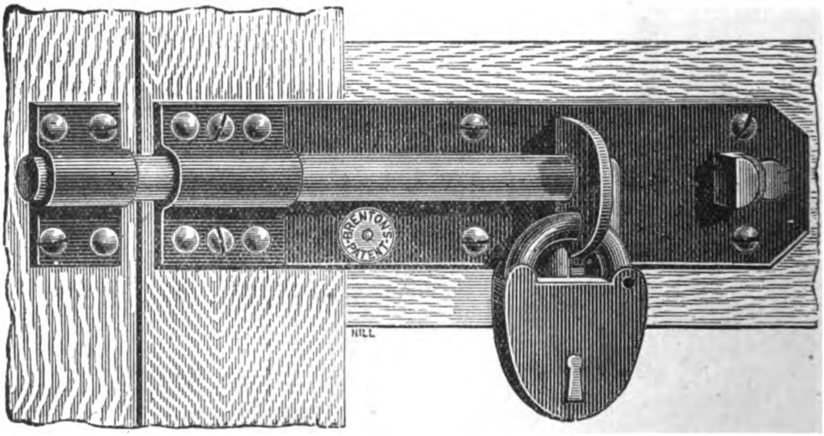


Fig. 65.—Brenton's Patent "Lockpin" Bolt, with Padlock.

MESSRS NALDER AND NALDER (LIMITED).

The engraving (fig. 66) represents the portable combined Thrashing and Straw-elevating Machine of Messrs Nalder and Nalder, of Challow Ironworks, Wantage, Berkshire. It is made under patent No. 4,738, November 22, 1878, of Thomas Nalder and William Nalder, and formed one of the most conspicuous novelties in its class at the recent International Exhibition of the Royal Agricultural Society at Kilburn, where, after a careful trial in the show-yard, it received a special first class award from the judges. One illustration shows the machine placed in working position, and the other the elevator taken down and packed upon the thrashing machine for travelling, or for being housed when not in use.

Of the many advantages of Messrs Nalder and Nalder's thrashing and straw-elevating machine the following may be enumerated :—1. The design is simple, inexpensive, easily kept in working order, and singularly free from objections to which all novelties are more or less subject at the starting in some of their details, and the patent covers several ways of carrying out the principle. 2. The combination enables the farmer to lay out his stackyard and build his corn stacks in harvest, so that he can place his threshing machine in windy weather on the lee side of his corn stack, and build his straw stack on the lee side of his threshing machine, thus gaining the assistance of the wind both in unstacking his corn and in stacking his straw. Thrashing can thus be done in windy weather, with fewer hands, and without loss of loose corn and straw blown about by the wind, as under the present system. Instead of a straw stack, carts and waggons may be loaded on the lee side of the threshing machine, and so on. To contractors who hire out machines the advantage is inestimable. 3. The combination will enable farmers to build their corn stacks in separate mows or bays, under permanently roofed stands, and to thrash and stack their straw under a continuation of the same, let the weather be wet or day, windy or calm. The elevator can also be applied to fixed or portable threshing machines in the barn. 4. No extra houseroom is re-

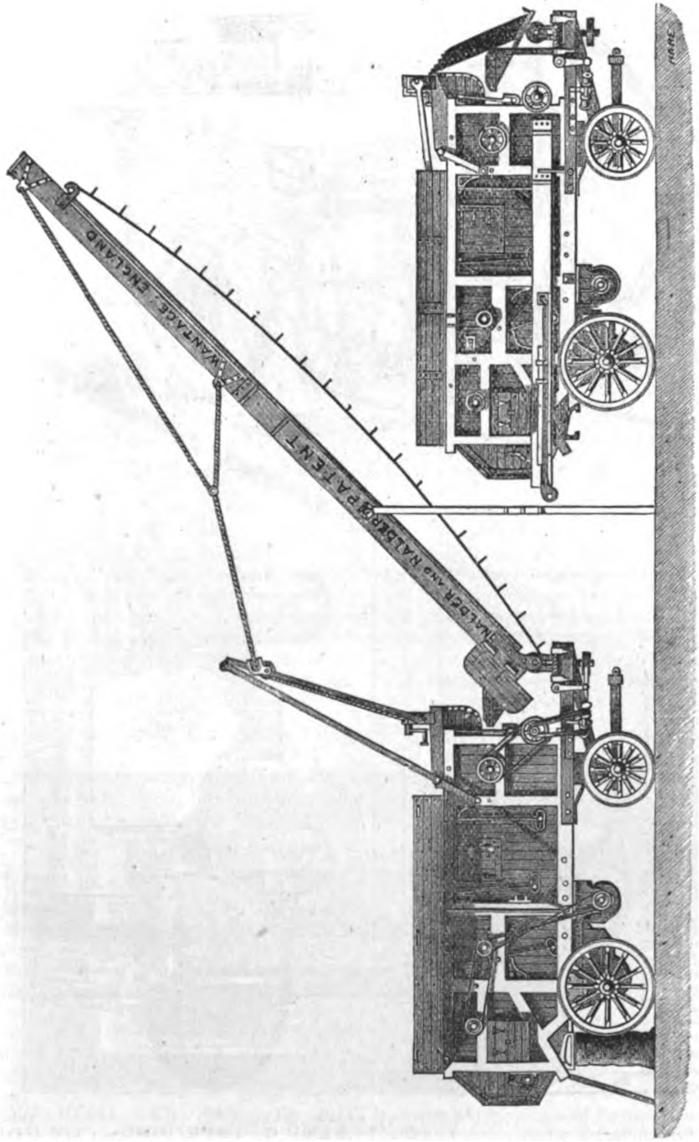


Fig. 66.—Nalder and Nalder's Combined Threshing and Elevating Machine.

quired for the elevator, and one tarpaulin or machine-cloth covers both the thrashing machine and elevator. 5. There is a great economy of time in starting the machine, and fewer hands are required to work it, whilst less driving power is consumed in stacking the straw. 6. The weight of the elevator, when packed, adds little to that of the thrashing machine, so that nearly the whole power required to haul a separate elevator from place to place is saved; and when hauled on the road, especially by a traction engine, it is much more convenient and easily managed in passing vehicles and entering gateways, than when the thrashing machine and elevator are separate, each on a four-wheeled carriage. 7. The machine can be used without the elevator in thrashing for thatch or for market, or a chaff cutter or straw bruiser can be attached for cutting up the straw into chaff, or bruising it as fast as thrashed.

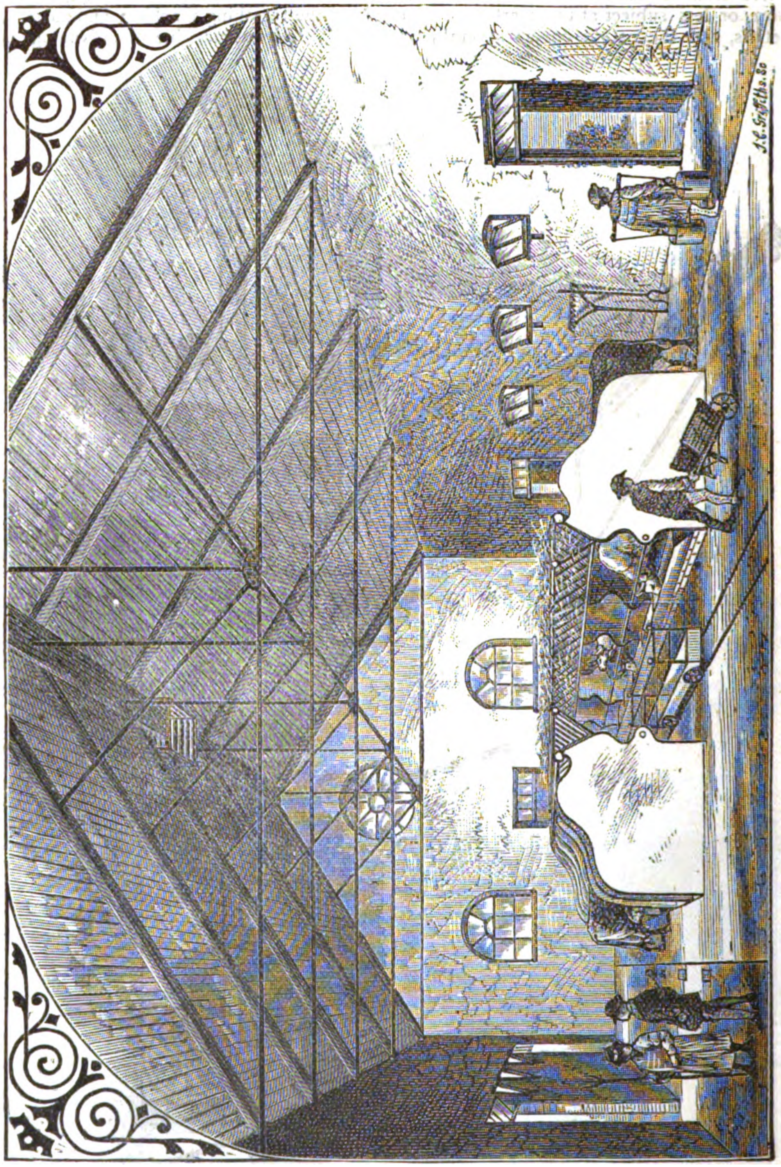


Fig. 67.—Improved Cowhouse Fittings of the St. Pancras Iron Work Company.

THE ST. PANCRAS IRON WORK COMPANY'S IMPROVED COWHOUSE AND PIGGERY FITTINGS.

If it is required to keep farm stock in perfect health, it is necessary that their surroundings should be clean. The connection between dirt and certain diseases is intimate. Where dirt itself and other insanitary conditions are not the direct cause of disease in the farm steadings any infection present cannot be removed without a thorough cleansing of the premises. Cowshed fittings made of wood get splintered, cracked, and otherwise injured, leaving crevices in which filth and infection lurk. They are then difficult to clean thoroughly; and infection once introduced into the shed causes indefinite trouble to purify them thoroughly and eradicate the germs of disease.

There is nothing like iron for cowhouse fittings. The material is economical, when its durability and safety is considered, and we are glad to find there is an increasing demand for this class of manufactures. To meet the demand the St. Pancras Iron Work Company, St. Pancras Road, London, N.W., have introduced numerous improvements in detail and a great variety of designs, with the special object of bringing these fittings into use by those who do not care to go to a great expense, and who wish to place their sheds in a satisfactory sanitary condition. The iron fittings constructed by them, in addition to their great durability, are constructed on sound principles, so that they are easily cleansed from all impurities of dirt and disease. In carrying out these improvements they have consulted the best authorities, such as Professor Simonds, of the Royal Veterinary College; Professor Burden-Sanderson and Dr Klein, of the Brown Institution; Professor Brown, chief of the Veterinary Department of the Privy Council, and others, who have specially investigated the nature of contagious diseases amongst cattle.

We have given at fig. 67 an illustration of the improved cowhouse fittings of the St. Pancras Iron Work Company. The stalls are sometimes made to hold one animal only, but it is more usual to make them large enough for two. The divisions are made of strong cast-iron. Cast-iron troughs run across the stall for roots, chaffed hay, &c., and in most cases a wrought-iron rack for hay or other fodder is provided. The water-supply for each stall is kept separate from the rest, to prevent the distribution of infection through the water-supply, should disease break out in any animal. One important point worthy of notice is that all these fittings may be used if required as tenant's fixtures, the mode of fixing being very simple, and at the same time perfectly secure. The paving and drainage fittings are admirably designed. The Company have paid special attention to these subjects, and in their ninth patent, recently taken out, they have embodied the best results of their experience.

Cleanliness should be studied with regard to the pig as well as other animals, and it is found economical to keep the pig-food clean and sweet. The piggery fittings of the St. Pancras Iron Work Company are admirable in design and material. At fig. 68 we give an illustration of their improved iron piggery troughs. The trough is fixed, and therefore not liable to spill the food. The shutter is made to close and open in a very simple manner, so as to keep the pigs away while the trough is being cleaned out or filled. The whole is very strongly made, and can be easily fixed or removed.

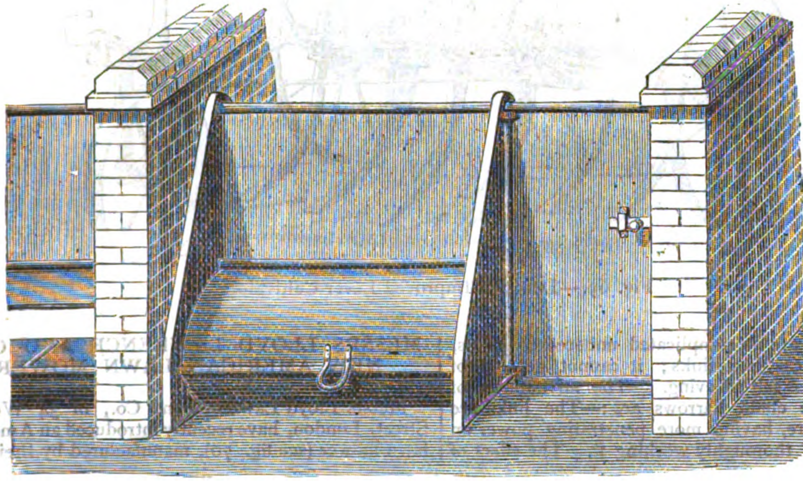


Fig. 68.—Improved Iron Piggery Troughs of the St. Pancras Iron Works Company.

DENTON'S IMPROVED LEVER CULTIVATOR, &c.

One of the most useful implements on an arable farm is a good cultivator. To the manufacture of this implement Mr Henry Denton, Snow Hill, Wolverhampton, has paid great attention. His improved lever cultivator is of excellent construction, and does its work well. It is fitted with improved leverage for lifting at the land's end. Mr Denton claims a special improvement in this implement, bringing into use, in its manufacture, Bessemer steel instead of wrought-iron. By this means a much lighter, yet much stronger implement is produced. Mr Denton is substituting this steel in every direction in the construction, believing it is the proper thing to do; for why, he asks, should horses drag a ton of metal behind them, when three-fourths that weight would answer the purpose equally well? Our agricultural implements are too heavy. Makers have been asleep over this matter until now the Americans have shown them how to combine light weight with strength and durability, and Mr Denton has been one of the first to profit by the example.

We might draw attention to the machine-made chain harrows made by this maker. It is made entirely of wrought iron. The links are turned by patented machinery, and made perfectly square, which is a great advantage over ordinary hand-made links. There are no complicated unnecessary joints, or breakable cast-iron links; it cannot get out of repair, and is self-relieving. The advantages of machine-made chain harrows are:—The links are perfectly square, having more penetrating power on the land, and thoroughly working it. The effect of a tine harrow is obtained with at least one-third of the draught, and a cheaper and better harrow produced.

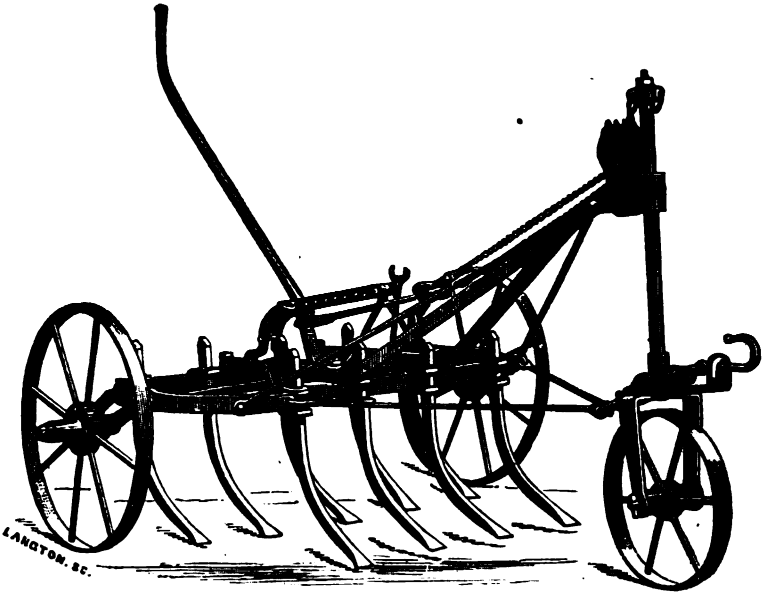


Fig. 69.—Denton's Improved Lever Cultivator.

MESSRS LLOYD LAWRENCE AND CO'S. NEW AMERICAN LAWN MOWER.

Messrs Lloyd Lawrence and Co., of 34 Worship Street, London, have recently introduced an American lawn mower (see fig. 70), manufactured by their own

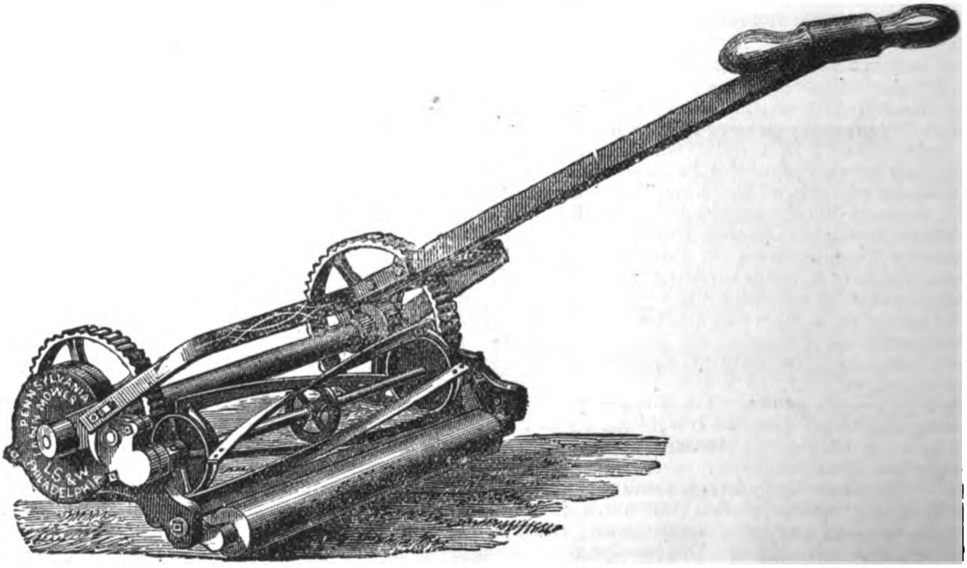


Fig. 70.—Lloyd, Lawrence and Co.'s New American Lawn Mower.

firm in Philadelphia U.S.A., which bids fair to effect **a revolution** in machines of its class. The "Pennsylvania" as it is styled, is the latest invention in the **way of** lawn mowers before the public, and certainly **possesses** many radical improvements, upon similar **existing** machines. Like other American implements **which** have met with such extensive sale in England, **one** great feature in the "Pennsylvania" is, its exceeding lightness in construction—so light, in fact, that **a** lady using a 12-inch or 14-inch machine can **rapidly** mow her own lawn, without necessitating **more** than a healthy agreeable exertion, and it is **claimed** that all sizes up to the largest can easily be **worked** by one man.

This lightness is partly obtained by substituting two **driving** wheels, in place of the old-fashioned iron **cylinders** of ordinary mowers; the manufacturers **asserting** that these cylinders simply render machines **cumbersome**, and clumsy to use, without having **sufficient** weight in them to be of any real service in **smoothing** the turf. The cutter blades, which are of **spiral** shape, made entirely of steel, revolve against a **fixed** knife, and have the advantage of being self-**sharpening**; by a simple but ingenious device, the knives may be worked by either wheel singly or by both wheels, which causes the machine to be specially efficient in mowing steep slopes or, terraces, the edges of walks and flower-beds. The independent action of the driving wheels is important, as in turning corners the motion of the outside wheel keeps the cutters revolving. It also enables a sharp corner to be turned without lifting the machine, or as is almost inevitable, with the roller digging up the ground.

Owing to the great speed with which the cutters revolve, their unique shape, and the absence of a front roller, grass can be well cut, of a growth up to 10 or 12 inches in height. The gearing of the machine is entirely covered in, which is considered advisable to prevent clogging. Another novel feature is that by the mechanical arrangement cut grass is thrown to the rear, and collecting boxes when used are fixed behind the machine, so that the operator has a clear view in front. Altogether the "Pennsylvania" may be described as of the simplest construction and devoid of all complicated mechanism; it is well made and strong, and apparently perfect in all points requisite to answer the purpose for which it is intended. We understand the machine has taken the foremost lead in America, and from the flattering way it has already been received on this side of the Atlantic, it will doubtless have, as it deserves, a very successful career.

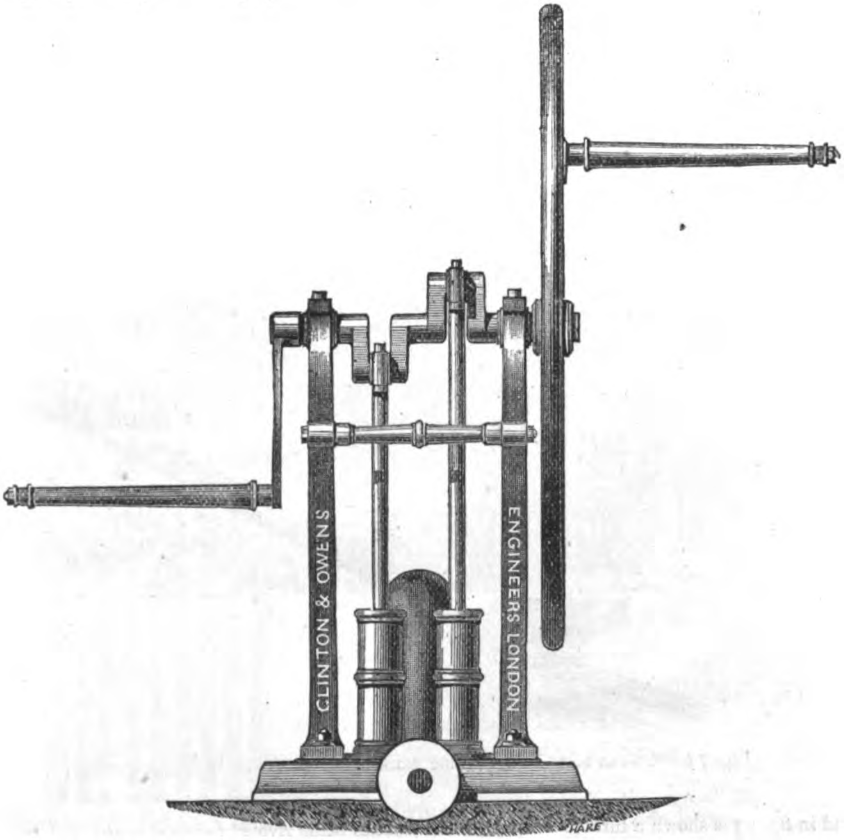


Fig. 71.—Owens and Co.'s Double-barrel Force Pumps.

MESSRS S. OWENS AND CO.

Messrs S. Owens and Co., Whitefriars Street, Fleet Street, E.C., are greatly distinguished for their hydraulic machinery, force pumps, &c., which they manufacture. The double barrel force pumps of this firm are made with brass-bored working barrels, brass valves, cast-iron air vessels, &c., mounted in strong, neat cast-iron frame, with base, double-throw cast-iron crank, with brass bearings, connecting rods, fly wheel and two-winch handles, ready for attaching suction and delivery pipes. This pump is adapted for shallow wells or tanks, and for supplying cisterns at a reasonable distance and elevation. For filling tanks, and for similar purposes, these pumps will be found very serviceable.

We give also an illustration (fig. 72) of an overshot water-wheel working a set of treble barrel pumps, manufactured and arranged by Messrs Owens and Co., and in fig. 73 is shown a turbine adapted to the same purpose. Machinery of this kind is very useful where it can be applied, and a most economical means in such places of obtaining motive power for thrashing, grinding, and various other agricultural purposes.

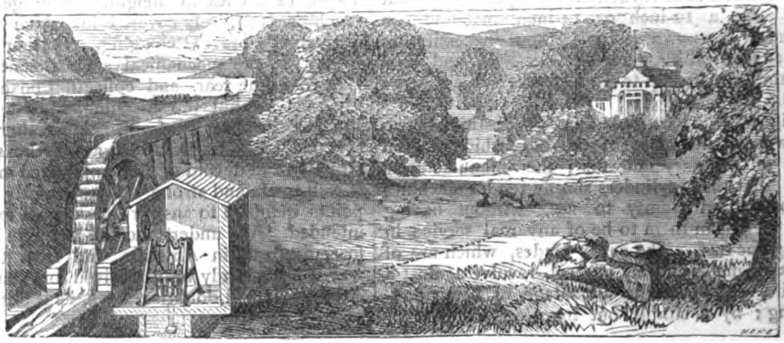


Fig. 72.—Owens and Co.'s Overshot Waterwheel working a set of Treble Barrel Pumps.

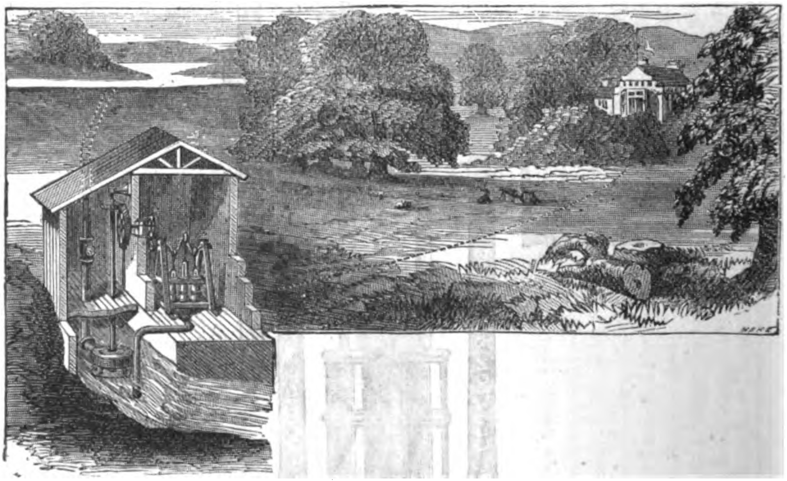


Fig. 73.—Owens and Co.'s Turbine working a set of Treble Barrel Pumps.

MESSRS DAVIES BROS. AND CO.

Messrs Davies Bros. and Co., Wolverhampton, are large manufacturers of galvanized iron roofs for hay barns, corn stores, covered farmyards, &c. They have introduced several improvements in iron roofing for agricultural purposes, with a view to increasing its efficiency, for the manufacture of which they have erected new and specially designed machinery. A roof made of their galvanized iron sheets can be erected in most situations at much less cost than slate and timber, and only for a little more than felt and boards, whilst it is much more durable than the latter. These roofs can be erected in a short space of time. The plates being riveted together in the best manner, and securely screwed to the timber framework or wall-plates, permanent efficiency is secured, and great cost for maintenance and repairs is saved. On account of its great strength and comparative lightness, this roofing is admirably suited for the most exposed situations, and can be erected with safety in positions where any other kind of roofing would not resist high winds and other exceptional causes which have to be contended with. It is readily removable without injury. The ordinary straight roofing can be taken down and refixed by any handy mechanic. It may here be remarked that galvanized iron of inferior quality, *i.e.* either made from common sheet iron or improperly galvanized, has been found, after a few years' use, to entirely disappoint the expectations of purchasers, by showing signs of decay; but this material, when properly prepared and galvanized, forms a permanently efficient roof. In the process of manufacture, even when the very best brands of sheet-iron and spelter are used, a small percentage of blemished or imperfect sheets show themselves. Messrs Davies Bros. and Co. assert that at their works every sheet, after manufacture, is thoroughly examined, and any such sheets that may be found are thrown aside as *defective* or waste sheets, and sold as such; so that customers may rely that the whole of the galvanized metal supplied is of a quality to form a thoroughly durable and permanently efficient roof.

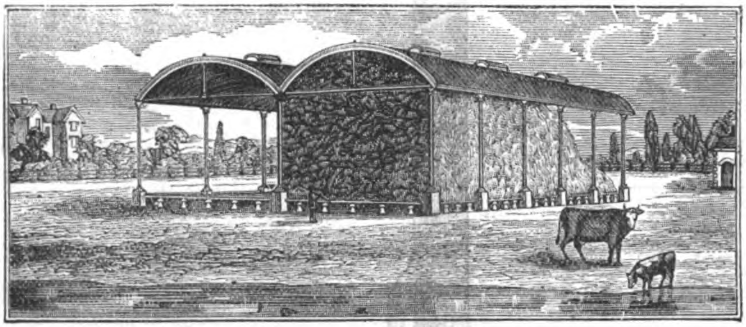


Fig. 74.—Davies Bros. and Co.'s Iron Roofing.

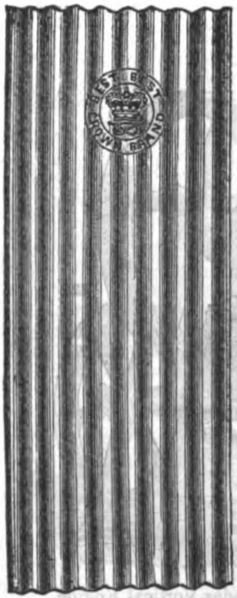


Fig. 75.—Davies Bros. and Co.'s Galvanized Corrugated Roofing Sheet.

The galvanized corrugated roofing sheets for fixing on light timber framework, manufactured by this firm, are useful and economical roofing material. The timber framework for this roofing being only about one-fourth of that required for slates, and the sheets being so quickly put on by any unpractised person, where an angle or sloping roof is preferred, galvanized corrugated straight sheets will be found to form an economical and thoroughly efficient roofing. The system of corrugating the sheets adds very much to the strength and rigidity of the iron, rendering it in a great measure self-supporting, so that very few rafters or purlines are needed. The sheets are not fastened to the rafters themselves, but to purlins laid upon the rafters. The rafters may therefore be much farther apart than is usual in slated roofs—say from 4 feet to 8 feet, according to the strength of the purlins. As a rule, the rafters may be placed fully 5 feet apart, if tne size of the purlins is 3 inches by 3 inches, or 4 inches by 2 inches. The purlins themselves should not be at a greater distance than from 5 feet to 6 feet. A corrugated sheet, 6 feet long by 8—3 inches corrugations, or 2 feet 3 inches wide, will cover a space 5 feet 8 inches by 2 feet, after allowing for laps; other lengths of sheets in the same proportion; that is, 3 inches to 4 inches to be allowed from the length. No allowance is necessary in the width, as a sheet with 8—3-inch corrugations will cover 2 feet wide.

MESSRS W. N. NICHOLSON AND SON

The Trent Iron Works, Newark (Messrs W. N. Nicholson and Son), provide a great variety of agricultural machinery, steam engines, boilers, &c., worthy the attention of practical farmers. Fig. 76 represents their new inverted cylinder vertical steam engine for farm and contractors' use, mounted on travelling wheels. When required as a fixture, the wheels are of course omitted. Complete, they are most useful engines, adapted for hoisting, builders' work, and every variety of farm machinery requiring the aid of steam power. The engine on Nicholson's system is independent of the boiler, and the boiler can be at once detached for repairing without interference with the engine. The feed pumps are continuous in their action and never require priming to start. By a simple link motion, when they are not needed to supply the boiler the water is returned to the tank without stopping them.

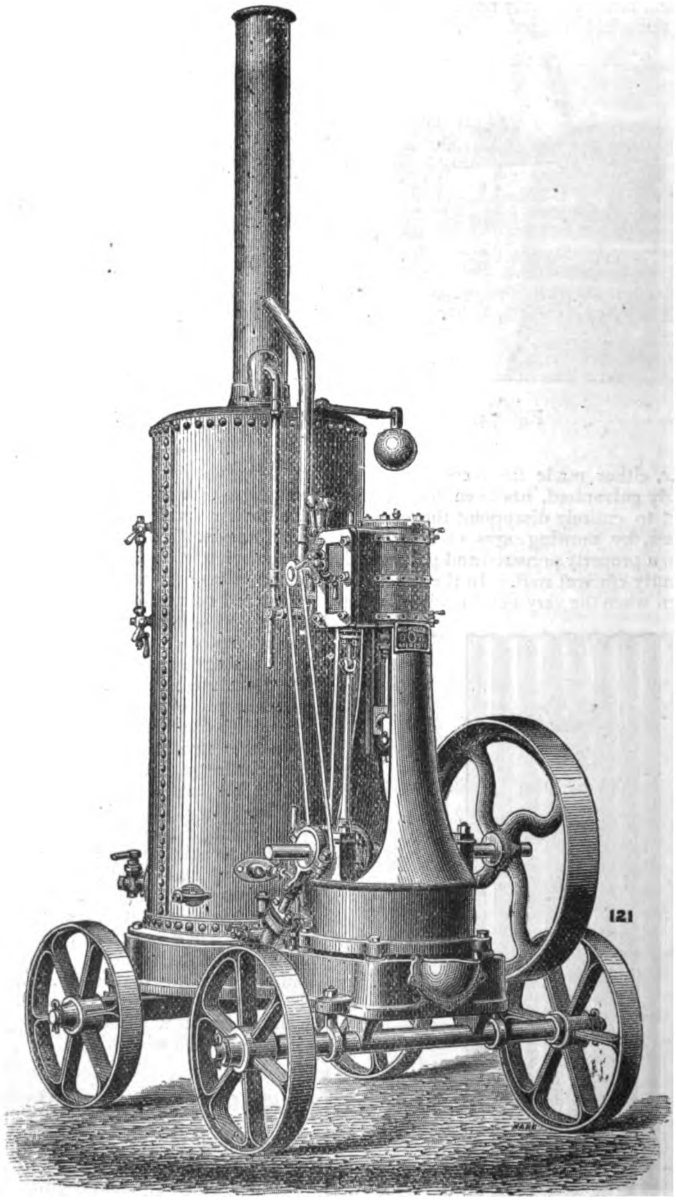


Fig. 76.—Nicholson and Son's Inverted Cylinder Vertical Engine.

A new kind of arrangement in harrows has been patented by this firm—the "Imperforate Beam" clip harrow. In this harrow all nuts, bolts, and screws, are done away with. No screw-key is therefore required, nor washer, nor hoop iron for locking nuts. There are no holes made in either beams or bars, hence they are strong and rigid at places which are usually weak points. All parts are interchangeable with great facility, and any farm labourer can take the teeth out and replace them with ease and security.

A new extra wide and strong cake-mill is represented at fig. 77. These are fitted with through main driving wheels for use by two men, or by horse or steam power. The rollers are 15 inches wide, and will take the wide foreign cakes now very commonly used. It has loose cutters 5½ inches in diameter, and breaks six sizes. It is well built, and answers its purpose admirably well.

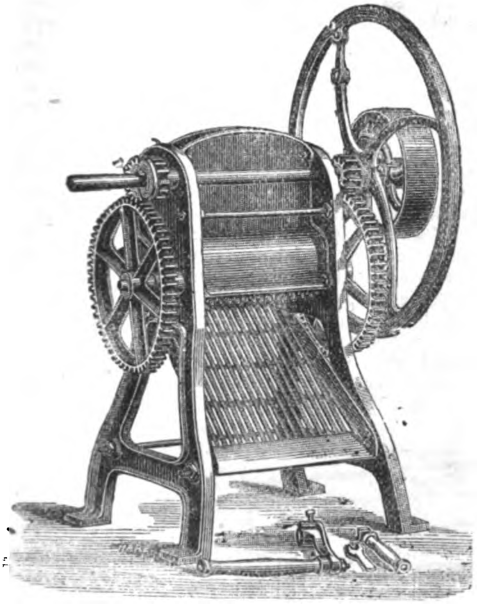


Fig. 77.—Nicholson and Son's New Extra Wide Cake Mill.

MESSRS PAMPHILON AND COMPANY.

One of the latest and not least useful applications of machinery to field operations is the introduction of machines for spreading farmyard manure from the cart whilst in motion. It is a great advantage to have the carting and spreading done at the same time. The labour of depositing manure heaps and then having to distribute them with the shovel is saved, and the land is immediately ready for the plough, so that there is no loss of ammonia, and the whole strength of the dung is applied to the soil. The patent Farmyard Manure-Spreading Machine, of Messrs Pamphilon and Co., of the Ixion Works, Whittlesford, Cambridge, is a novel implement which has this advantage over some other inventions, viz., that the spreader is attachable to a cart of any size, and one only is required. The operation is as follows :—The man who usually pulls the dung out of the cart into heaps draws the dung off the cart into the machine ; revolving tines, on a travelling web, take it round, divide, and distribute it with considerable regularity, bringing it to the rear of the machine, where it is brought into contact with a helical agitator, revolving at a rapid rate, thereby thoroughly parting the dung. The machine will deliver from fifty to seventy loads a day, or from five to six acres. The saving of spreading at 2s. or 2s. 6d. an acre, as well as the more minute separation, represents the advantage for the outlay. The thickness of the deposit is chiefly regulated by the speed of the travelling web. The road wheels work the distributor ; therefore the greater the speed of the horses the thinner the dressing. It is also partly regulated by a sliding feed board. No extra horse-power is required, as the extra draught is only 2 cwt.

Pamphilon and Co.'s patent artificial manure distributor is also worthy of notice. This distributor will spread broad-cast or in drills all kinds of artificial manures, soot, salt, and nitrate of soda, and this in smaller quantities than any machine yet produced. The machine is drawn by a horse in shafts, and is composed of an upper and lower box, and so constructed that as it is drawn over the ground the lower box is made to rapidly oscillate in a lateral direction, and imitating the action of a man's hand in manual distribution. The upper box is fitted with an occasional stirrer that can be moved at will by a man following the machine. It is only necessary to use this stirrer when nitrate of soda or any artificial manure that is likely to work up into a cake is being distributed. The boxes are made of wood, and there are no cups to get choked, consequently there is no iron to be corroded, and the dressing is always the same and perfectly regular. This machine was awarded the special prize for artificial manure-spreaders offered by the Glamorganshire Agricultural Society, and also a silver medal at Manchester for the best distributor. A similar prize awarded at Long Sutton.

FRANCIS AND ARTHUR DICKSON AND SONS' PATENT NEW SEED-CLEANING MACHINES.

The new seed-cleaning machines recently erected by Messrs Francis and Arthur Dickson and Sons in their Farm Seed Warehouse, St. John Street, Chester, are of a highly interesting character, and worthy a visit from any one interested in the purity and cleanliness of farm seeds. These machines are not less remarkable for their cleaning power than for their extraordinary simplicity of operation. They are entirely self-acting, and all they require is to be supplied with seed to be cleaned, and to have the full sacks of clean seed removed after they have done their work. On the upper storey of the warehouse is placed a hopper for the reception of the seed to be cleaned. Into this hopper the sacks of clover or other seeds are shot. A simple contrivance regulates the supply, and nothing further requires to be done but to remove the sacks into which the seed is run direct from the machine, on the floor below, as soon as they are filled. This machine cleans 10 tons of clover per day, and removes small seeds, weeds, fine sand, dust, &c. On the floor where the above-mentioned machine delivers the seed cleaned by this first process, there are two large hoppers, capable of holding 5 tons of clover seed, and into these hoppers the seed which has already passed through the No. 1 machine is filled.

The machine we have now reached (which we may describe as No. 2 machine) is a marvel of ingenuity and simplicity, and although occupying a moderate space, has a cleaning surface of 84 square feet, and is capable of cleaning five tons of clover seed per day. The seed having been filled into the hoppers (a day's supply can be put in at once) the machine—which is on the floor below—adjusted by elevation or depression according to the description of seed to be cleaned, and the supply regulated, nothing further remains to be done but to remove the sacks of cleaned seed when they are filled, and as eight sacks are being filled at one time, the machine may be left entirely to itself for two or three hours at a time, the work of cleaning going on all the same. The capabilities of the No. 2 machine are quite extraordinary, as without the slightest application of manual or steam power all partially developed seeds, weeds, and all extraneous matter are separated from the perfect seeds, the good seed running into a row of sacks on the outside of the machine, while the inferior seeds and refuse are received into sacks inside the machine.

Messrs Dickson are the sole possessors of these machines, no other house in the trade having similar ones. This must be of *great advantage* and importance to Messrs Dickson and to those who use their seeds, as seeds cleaned by these machines must unquestionably far surpass in *purity* and *percentage* of growth those cleaned by the old-fashioned method of winnowing and sifting, which fails to remove all weeds, or those which are sent out without cleaning at all.

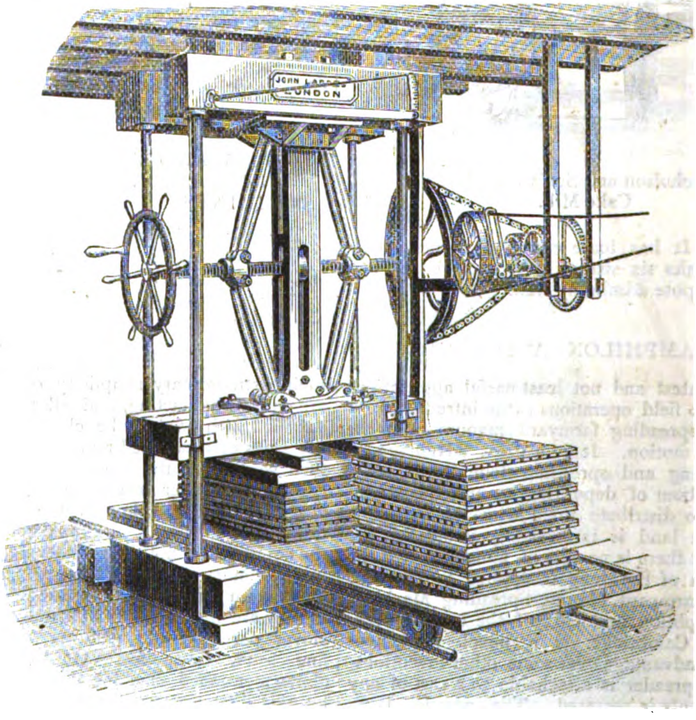


Fig. 78.—J. H. Ladd and Co.'s Power Cider Press.

MESSRS J. H. LADD AND CO.'S "BOOMER" CIDER AND HAY PRESSES.

Messrs John H. Ladd and Co., 116 Queen Victoria Street, are the sole proprietors of the now well-known "Boomer" press in all its various forms and combinations. The principle by which the enormous power is acquired is by a combination of four levers or arms working upon toggle-joints, through which passes a right and a left hand screw. The rotation then of the screw will cause the two joints either to approach or diverge—according to the direction of such rotation—with perfectly uniform motion. The sliding standard, as shown, runs through the top frame, and keeps the pressing-plate in its true horizontal position, controls the power, and prevents any endwise motion of the screw. The gross load is not thrown upon the sliding faces of the screw, but is transmitted through the toggle-joints to the top frame or head-block, connected with the base by the usual wrought-iron pillars. One of these, a power cider press, is illustrated at fig. 78. The complete combination of press, power, attachment, double platform, racks, cloths, and indicator, was first placed upon the market in the cider season of 1876, and before the close of that season proved superior to our claims. In October of that year, at the Centennial Exhibition, Philadelphia, it made 116⅔ barrels of cider in nine hours and forty-five minutes, from 870 bushels of apples. It accomplished this without the convenience of a well-ordered cider mill, and with the improvements which have since been added, it is said it can go far beyond that point. To those who have not seen its capabilities demonstrated, we would call attention to the following detailed description of its parts:—Probably, first in importance beyond the press itself is the patent double platform. It is made of four-inch pine plank securely bolted together, and has a length of 12½ feet and a width of 6 feet, with strips running around the outer edge, to retain the cider. I is mounted upon trucks, which rest upon an iron track, giving it a movement sufficient to bring either cheese under the follower of the press. The platform is raised one inch from the bed of the press, but the pressure being applied, the press raises until it comes in contact with the platform. Two wooden rollers rest upon blocks of wood fastened to the floor or timbers upon which the track is placed. These rollers prevent the platform from depression while the weight of the cheese is upon it. To the platform is added a shifting gear. It consists of a crank and gearing, with chain so attached as to move the platform quickly and steadily across the bed of the press. The platform is of sufficient size to hold a cheese upon each end, permitting the laying up of one cheese while the other is being pressed, thus nearly doubling the capacity of the press. The power attachment, by which the press is run, is a very important auxiliary to the press, and completes the combination which renders this power press so ef-

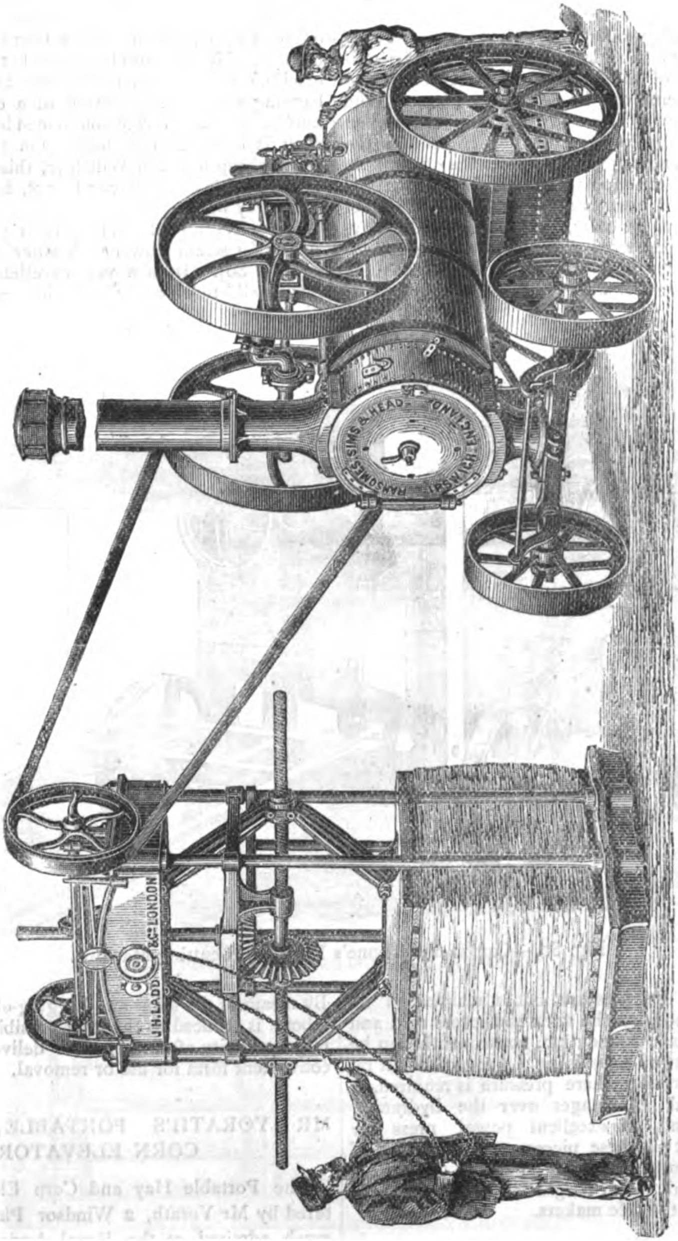

RANSOMES, SIMS & HEAD, IPSWICH, ENGLAND
J.H. LADD &Co LONDON

Fig. 79.—J. H. Ladd and Co.'s Power Press for Truss Hay.

fective. It is speeded to run down in an hour; and ordinarily ten to fifteen minutes is allowed for the pomace to drain, and ten minutes with which to run the follower up and shift the cheese—and thus seven pressings may be run off in ten hours, averaging 12 barrels each, or 84 barrels in ten hours. This result can be accomplished every day without hurry or overstrain of any kind, producing 4 gallons per bushel of 50 lbs. By a system of levers which accurately indicate the spring of the head beam of the press, the amount of pressure can be seen at a glance. The advantage of this will be readily seen, especially when presses are run by power. It greatly reduces the possibilities of breakage, and enables the operator to determine when the pomace is sufficiently pressed.

The "Boomer" press is made to suit a variety of purposes, namely: for cider, wine, seeds, oils, hay, cotton, cloth, paper, wool, &c. It is simple in construction, and not liable to get out of order. The power accumulates at every turn of the screw. It never yields to the pressure, but is maintained no matter in what position the arms and levers rest, and it requires no made foundation, consequently can be placed in any part of a building or moved about on wheels. For purposes where pressure is required, it possesses several advantages over the hydraulic. Fig. 79 represents an excellent power press for truss hay. That all these pieces are constructed of good material and well made may be taken for granted, as Messrs Head, Wrightson, and Co., Stockton-on-Tees, are the sole makers.

MESSRS CARSON AND TOONE.

The chaff-cutting engines of Messrs Carson and Toone for steam power are very complete. The judges at the Oxford meeting of the Royal Agricultural Society spoke highly of them. They remarked that "The chaff was excellently cut, not ¾ but [illegible] ¼ inch. It was clear that the first set of grooved rollers levelled the straw, and prepared it to be carried to the mouth by the second set, and this materially assisted the attendants. In order to secure strength the wheels are of malleable iron, the spindles are large, the bearings of brass, the frame of wood, which Messrs Carson and Toone [illegible] more durable, the iron being liable to fracture. The machine is mounted on wheels, and fitted with bagging apparatus consisting of a case enclosing the knives, with an elevator on one side, from which the chaff is delivered into bags. On the large and exposed sheep-farms in Wiltshire, this addition is [illegible] very valuable, as chaff can be cut, however rough the wind may be."

We select for illustration their prize chaff-cutting engine for steam power with sifter and bagging [illegible] (see fig. 80). It is a very excellent arrangement [illegible] these well-known and thoroughly practical machines. By means of the sifter and bagging-elevator the hand-labour is reduced to the least possible amount, and a large quantity of fine chaff is delivered in the most convenient form for use or removal.

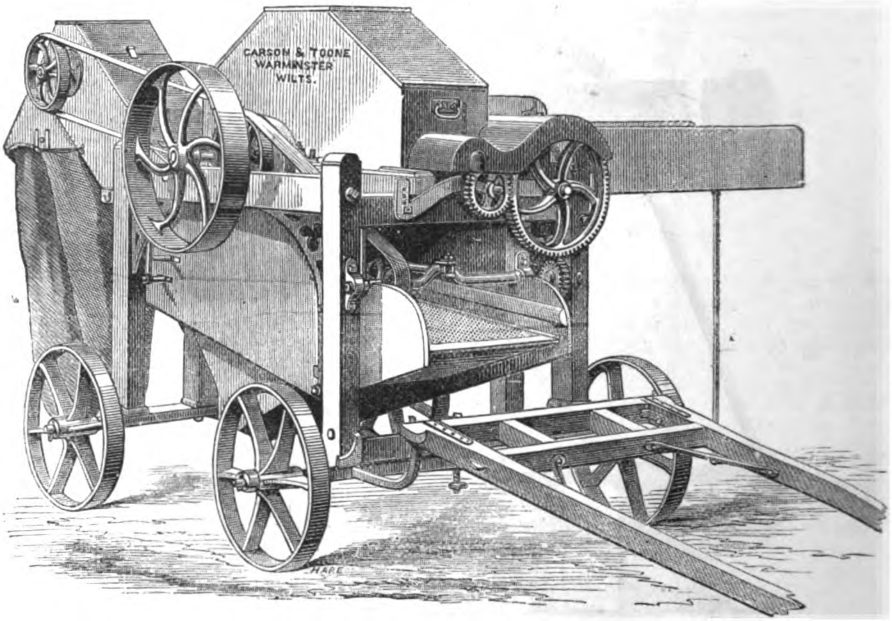


Fig. 80.—Carson and Toone's Prize Chaff-cutting Machine.

MR YORATH'S PORTABLE HAY AND CORN ELEVATOR.

The Portable Hay and Corn Elevator manufactured by Mr Yorath, 2 Windsor Place, Cardiff, was much admired at the Royal Agricultural Society's Exhibition there, and it has retained its popularity ever since. One important feature in the patent horse-fork elevator is that it is easy of erection. Three ordinary farm labourers can adjust the pole and pulleys in a quarter of an hour or thereby. By means of the Elevator, a waggon-load of hay can be raised to the greatest height that it is desirable to construct hay stacks, in from five to eight minutes, and it can easily keep half-a-dozen men pitching into the waggon in the field. Mr Yorath's Elevator is not liable to breakage, and so easy of management that a careful boy can direct its operations and keep the stackers going. Those who have had its practical use for years are loud in its praise, which, from our own knowledge of it, we can fully appreciate.

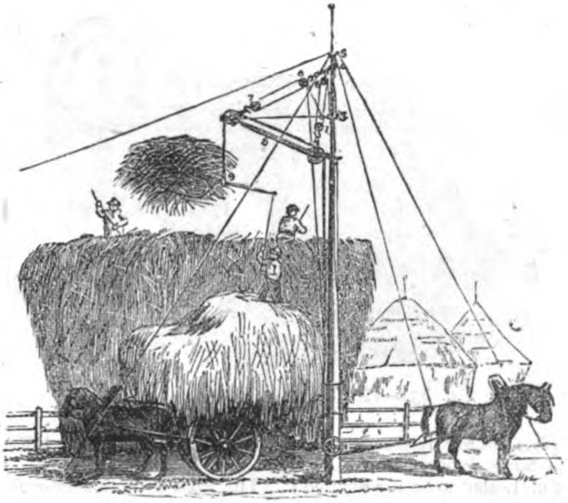


Fig. 81.—Mr Yorath's Portable Elevator for Stacking.

MR R. S. MONCASTER'S CONTINUOUS IRON FENCE.

Where it is desirable to use iron fencing of a strong, durable, and efficient kind the continuous iron fencing (fig. 82) of Mr R. S. Moncaster, of Kirk-Ella, Hull, will be found of admirable character. As a cattle-guard it is strong, and stock cannot be injured by it. It is most easy to fix, and when set up makes a substantial and neat fence suitable for any purpose where iron fencing is used. Any ordinary workman or handy labourer, with the aid of a hammer, chisel, and punch, supplemented by a crowbar and wooden mallet, may easily fix or remove them. The iron guards, hurdles, field gates, and wire fencing of Mr Moncaster are all deserving of high commendation.

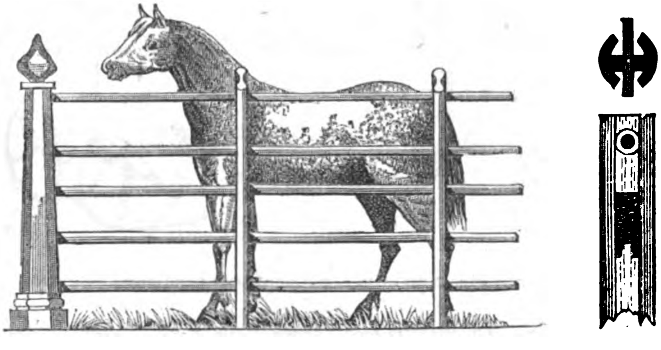


Fig. 82.—Moncaster's Continuous Iron Fence.

HALL'S PATENT BONE-DUST MILL (THE SAVILE STREET FOUNDRY COMPANY, SHEFFIELD).

The increased demand for artificial manures and especially of bone manures within recent years has stimulated the improvement of machinery for treating bones and preparing them for manurial use. We illustrate the successful application of the principle of disintegration in a machine (fig. 83) manufactured by the Savile Street Foundry of Sheffield, for the rapid reduction of bones, hoofs, horns, &c., into bone dust and meal for sowing. It is the invention of Mr Hall, of Sheffield, who has long been connected with the manufacture of machinery for manure and chemical works. Briefly stated, the machine consists of a cast-iron casing, divided along its horizontal centre line and hinged at the back, so that its internal parts may be easily got at. Doors are placed at the back end, so that the screens may be examined and replaced. A centre shaft of Swedish steel, revolving at 1,700 revolutions per minute, in very long bearings lined with gun metal or phosphor bronze bushes, carries midway in the casing two large wrought-iron discs, between which four pairs of beater arms are secured in dove-tails, so that it is utterly impossible for them to move or draw out by centrifugal force. The two discs are drawn together by turned bolts. It is claimed for this patented method of securing the arms, that it affords the greatest amount of security against any accident, from the parts employed or from foreign material getting into the machine—a great point in all high speed machinery. The circular feed opening is 9-inch diameter, and the churning of the air and dust in the machine is carefully prevented by large air ways. In the mill illustrated the bones are dashed to pieces and separated in the machine against best cast-tool steel bars, which can be taken out separately and turned round to present a fresh wearing surface when the edge is worn off. The beaters are double and faced with steel, and can be refaced by any ordinary blacksmith, whilst the end secured to the centre disc is always tight and never requires touching. The spindle is carefully balanced and all pains are taken to make the machine perfect in every respect.

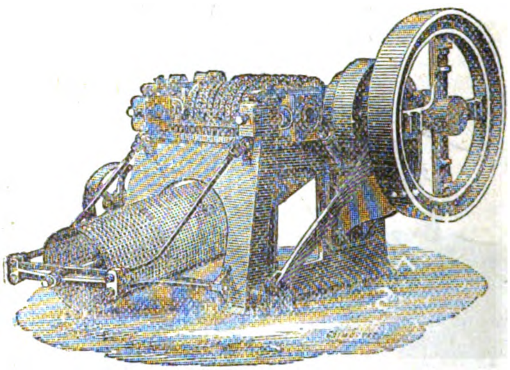


Fig. 83.—Hall's Patent Bone-Dust Mill.

MESSRS KELL, MEATS, AND CO.

The Ross and Gloucester firm of engineers, Messrs Kell, Meats, and Co. (late S. A. and H. Kell) produce some excellent agricultural implements. Among these their wrought-iron combined scarifier, broadside parer, or cultivator, deserves attention. This implement (fig. 84) is upon wheels 2 feet 8 inches high with lever and cranked axle, for raising the tines at land's end. This implement, when fitted with a set of points and a set of hoes, answers the purpose of a broadshare parer, cultivator, or scarifier, and can be used with great success in breaking up lands for spring corn, making summer fallows, and paring stubble after harvest. For each of these purposes it is well adapted. It possesses an advantage in being always ready to travel from field to field, or to enter the ground from one to ten inches deep without the

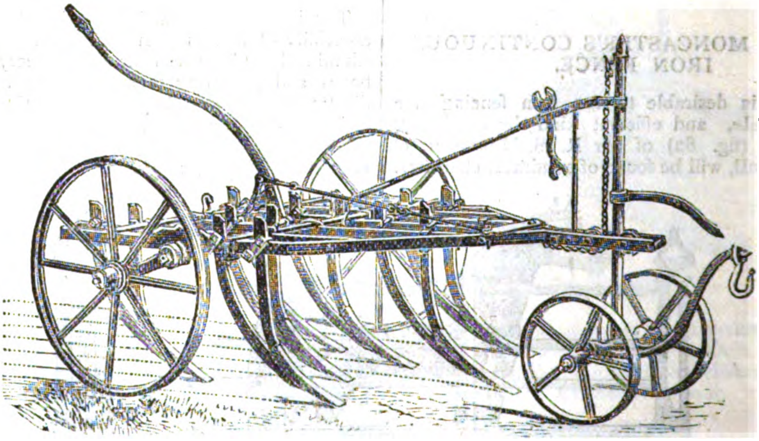


Fig. 84.—Kell, Meats and Co.'s Wrought-iron Combined Scarifier.

usual trouble and delay of having to alter its height on the wheels, the depth being regulated by hooking the regulating chain longer or shorter. The tines are made with double stems or stalks: a plan which gives them very great strength when working in hard ground, when these tines, it is said, have never been known to bend in work.

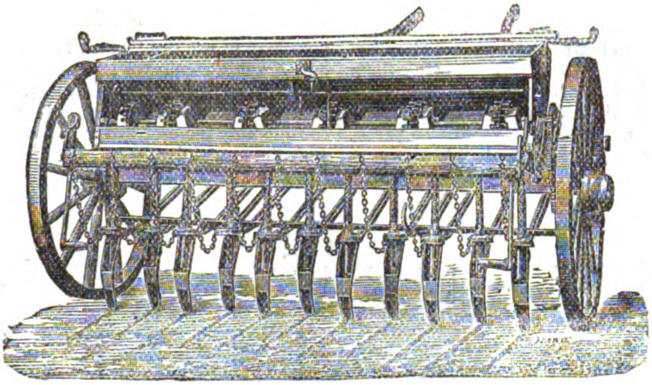


Fig. 85.—Kell, Meats and Co.'s Drill for all sorts of Grain.

Messrs Kell, Meats, and Co.'s three, four, five, and six-row drills for all sorts of grain, turnips, mangolds, &c., are widely known. They are made of wrought-iron, combining lightness with strength. They are nicely made in appearance, as may be seen from the accompanying illustration of a three-row drill (fig. 85). They work with cups and change wheels, in the same way as the Suffolk lever drills, and are so constructed that the distance of the rows may be varied with pleasure. Messrs Kell, Meats, and Co. are the original inventors of these drills.

They are also the manufacturers of an excellent broadcast manure distributor for all kinds of patent and coarse manures. It consists of a wood barrel and revolving stirrers for delivering the manure, and is so made as to bring the least possible amount of iron into contact with the manure, thus preventing corrosion and breakage. Scrapers and lateral stirrers (which are sometimes sources of trouble and annoyance to those who use them) are superseded and done away with entirely. This machine distributes half-inch bones, and other manures, from 2 cwt. per acre to any quantity required, and is so easily altered that the quantity can be varied to suit the quality of the soil, as it moves along. No extra barrel is required for rough manures, as is the case with some distributors. Hoppers can be affixed to this distributor, to drill the manure in any number of rows.

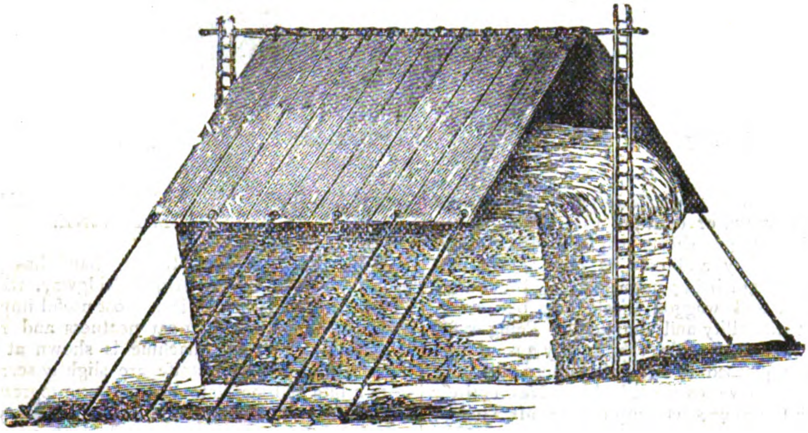


Fig. 86.—Bradburn's Combined Rick and Waggon Sheet.

BRADBURN'S COMBINED RICK AND WAGGON SHEETS.

In our uncertain climate there is some difficulty and anxiety in making hay at all—especially in the present showery summer. And even when properly made and brought into the rickyard it not unfrequently gets damaged in the rick before it can be thatched. The same misfortune also occurs in the case of corn. A most admirable provision against such an untoward event is the possession of waterproof sheets, by which the ricks can be covered. Mr Thomas Bradburn, Wednesfield, Wolverhampton, has introduced a novelty in his combined rick and waggon sheets. (See fig. 86.) The ordinary waggon sheets, always serviceable on a farm, are provided with eyelet holes, so that two or more can be laced together to form a covering for the rick. By lacing together two of Mr Bradburn's waterproof sheets, 6 yards by 4 yards each, and throwing them over a pole supported by two ladders, or upon tressels placed on the rick, shown in the accompany illustration, you have a rick sheet, 8 yards by 6 yards, at a cost of £6 ; as well as, when unlaced, two very serviceable waggon sheets sufficiently large to cover a load of hay, straw, or corn ; if this should be too small, any size waggon sheets can be made to lace. A great deal of hay and corn is often spoilt in a single night through being unprotected. Bradburn's combined rick and waggon sheets may be recommended for their utility and simplicity. Being easily erected and very serviceable, they supply a want long felt. We are pleased to hear that those who have purchased any have expressed themselves entirely satisfied with the sheets as supplied by Mr Thomas Bradburn.

MR JOHN MATTHEWS'S ROOFING TILES.

At the Royal Pottery, Weston-super-Mare, Mr John Matthews has a fine collection of terra-cotta, statuary, rockwork pedestals, garden pots, pans, and stands for all kinds of flowers, and other floral requisites and rustic adornments. Among the specialties may be mentioned his square-cornered "bonding roll" roofing tiles (fig. 87). Among the advantages claimed for these tiles are the following :—1. "Break-joint" lap, by which great tie or bond is given to the tiles diagonally, thus preventing "wind-stripping." 2. The "break-joint" lap does not require cut corners or shoulders, thus allowing the side fillet or roll to be continued from top to bottom of the tile, giving perfect side barriers ; and as the joints rest upon the middle of the tiles below, and the middle rows cover the upper parts of joints, no water can drift in. 3. The faults of the old forms of tiles having been got rid of in the new patent tiles, it is not necessary to use the "black tarred" felt under them; but, if a non-conductor is required, the plain felt may be used (prepared otherwise). 4. The new tiles are as light as other roll tiles, and their expense is not considerably increased over the old forms, consistent with the extra advantage.

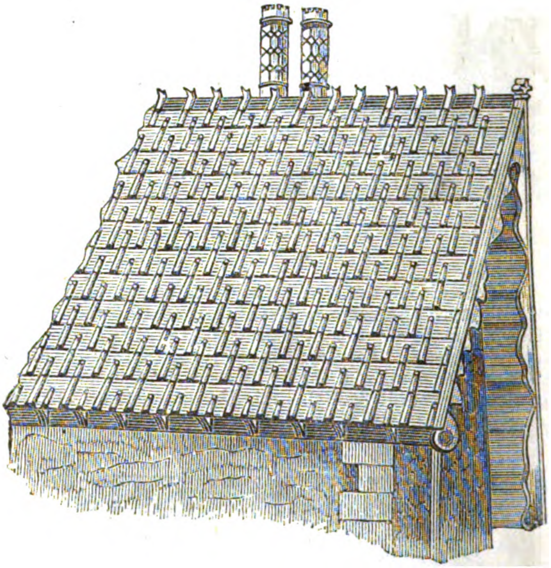


Fig. 87.—Matthews's Square Cornered "Bounding Roll" Roofing Tiles.

RIDGWAY'S NEW PATENT HEDGE-CUTTING MACHINE.

A machine for hedge-cutting by hand has recently been introduced by Mr Alfred Ridgway, 18 Market Place, Macclesfield. It is a most useful implement, and does its work with great neatness and rapidity. The character of the machine is shown at fig. 88. The teeth of the back knife are slightly serrated, to form a bite and facilitate the cutting progress. The top knife only is sharpened when necessary. The principle of its construction and application is the same as that of the mowing machine or the horse clipper, and used in the way of the latter it performs its work most effectually and rapidly. Every action of the machine does work, and in this respect it differs from the shears, which only cuts with the closing motion. In the hedge pruner both motions do the cutting, and hence there is a great saving of labour. The implement is light to handle, acts with great freedom, and does its work thoroughly and quickly. The operator may keep on walking at a slow but constant pace, all the time working the machine and cutting the hedge. At fig. 89 the hedge cutter is shown in operation. As to the amount of work that can be gone through in a given time compared with the ordinary dubbing shears, the difference is enormously in favour of the new machine. In the case of garden hedges kept in good condition, it literally mows off the shoots at a surprising rate, and with a regularity that puts the dubbing shears quite in the shade, and will moreover cut off shoots nearly an inch in thickness with much greater ease than an ordinary pair of shears. To gardeners and farmers alike it must prove a valuable labour-saving appliance, and as such we can strongly recommend it.

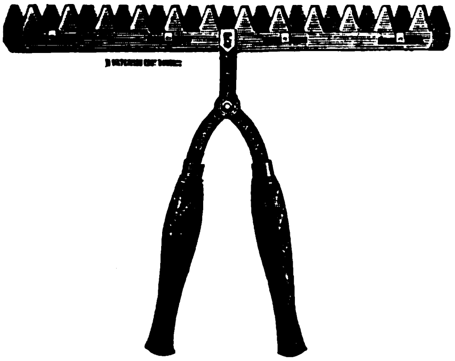


Fig. 88.—Ridgway's New Patent Hedge-cutting Machine.

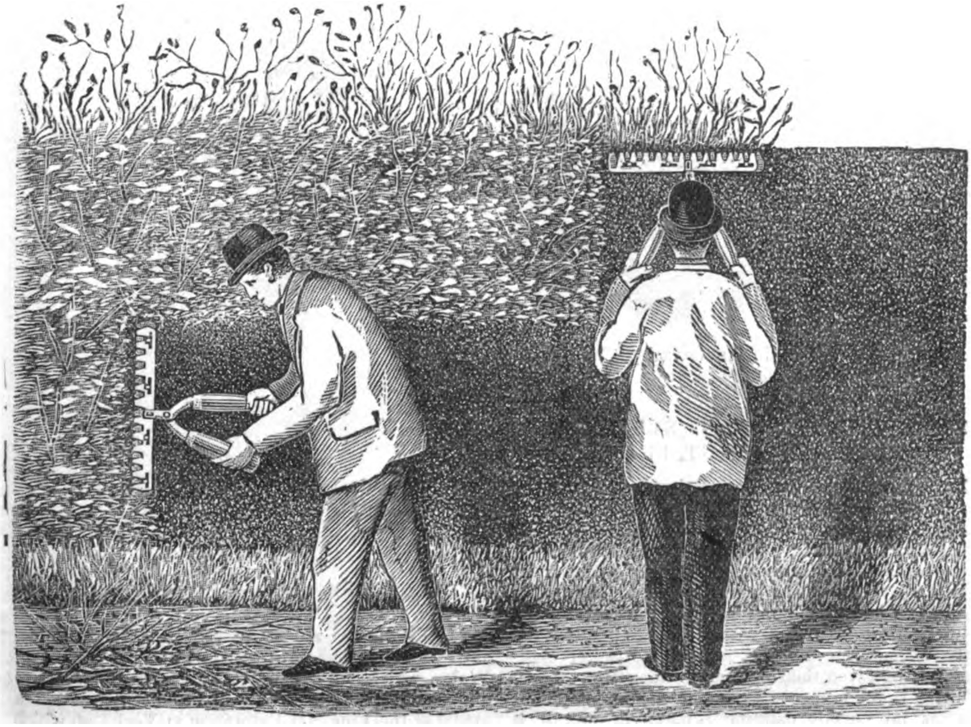


Fig. 89.—Ridgway's Hedge-Cutting Machine in Operation.

THE STANDARD MANUFACTURING COMPANY'S "STANDARD" TREE PRUNER.

An ingenious tree pruner has been introduced by the Standard Manufacturing Company, Derby. It is a most convenient implement; it makes an easy, smooth cut without injury to the bark of the tree. A distance of 16 or 20 feet can be reached by it in pruning without climbing, thus rendering the steps, ladder, saw, and shears unnecessary. It will cut wood of good size and also clip the slightest twig on the extreme end of the branch. The knife being connected by a metal rod, the pole may be of any reasonable length. The small space required for working the knife allows it to be used among dense branches where great difficulty is found in using the old-fashioned shears. It may be used for trimming and pruning fruit trees, holly bushes, laurels, and other ornamental trees, wall climbers, &c., and for thinning out fruit it is very desirable, and can be used as a fruit gatherer with great service. It is handy, easy to work, and exceedingly simple in construction. Those who have used it speak high praise of its peculiar merits. Fig. 90 is an illustration of this novel implement.

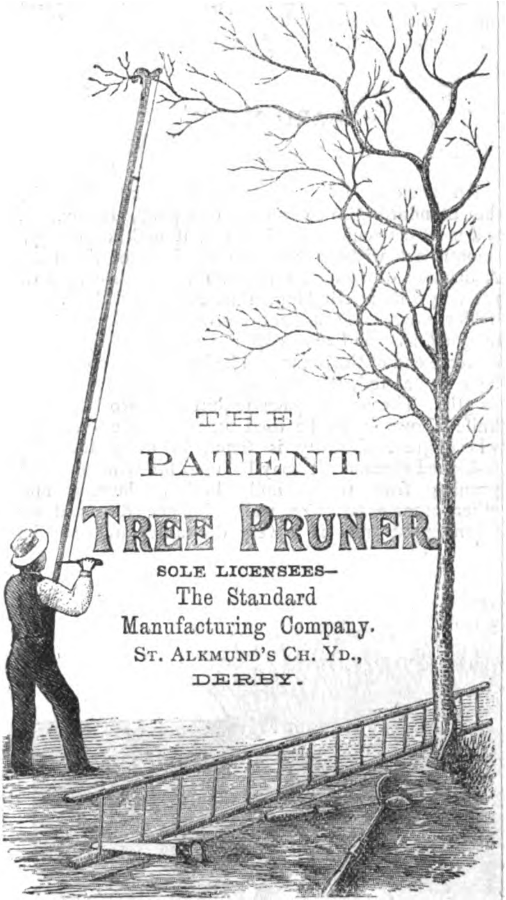


Fig. 90.—The Standard Manufacturing Company's Patent Tree Pruner.

HELLIWELL'S PATENT SYSTEM OF GLAZING WITHOUT PUTTY.

In this system all wood-work is covered, and by the peculiar arrangement of the glass the roof is rendered perfectly watertight and free from rattle. In horticultural buildings there is no drip from condensation, and plants are found to grow better under such roofs, there being a much greater and more equal distribution of light. Forcing houses require no more heat than they would if glazed on the old putty system, an eminent firm of hot-water engineers having given their opinion to this effect.

There is an immense saving in such a system as this, as no outside painting is required, and it is calculated that the cost of a house will be entirely saved in twelve years. It has also the advantage of being readily repaired, as each square of glass can be instantly removed and replaced without touching the fasteners.

The most important feature of the system, however, to country gentlemen, is the immense advantage it affords in covering farm sheds. Roofs constructed on this principle are much lighter and cheaper than slated roofs; they keep out the heat and glare of the sun, and, all woodwork being covered, they are practically imperishable.

The patentee, Mr T. W. Helliwell, Brighouse, Yorkshire, and 19 Parliament Street, London, has done a large amount of work on all kinds of buildings, as the system is adapted to station roofs, sheds, baths, drill halls, corn exchanges, conservatories, &c., &c.

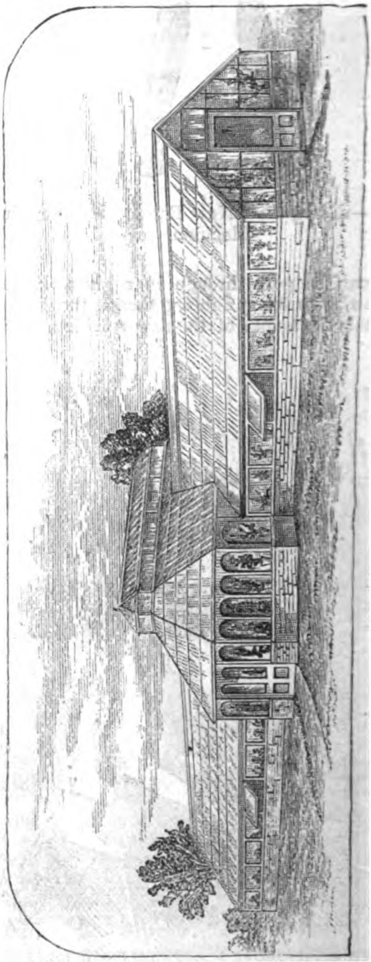


Fig. 91.—Helliwell's Patent Glazing and Covering Roofs.

Mr Helliwell has recently covered in a large stable-yard at Sandringham for H.R.H. the Prince of Wales, which has given great satisfaction. We also understand that Mr Helliwell has been awarded a medal at the Fine Art Exhibition at York, on which building he has above 11,000 feet of glass.

This system is now extensively used all over the country for all kinds of roofs, and it is certain to be still more extensively adopted, as it appears to supply a long-felt want, and at last enables us to do away with the everlasting nuisance of painting and puttying.

RICHMOND & CHANDLER,

SALFORD, MANCHESTER,

MANUFACTURERS OF

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CHAFF-CUTTERS,

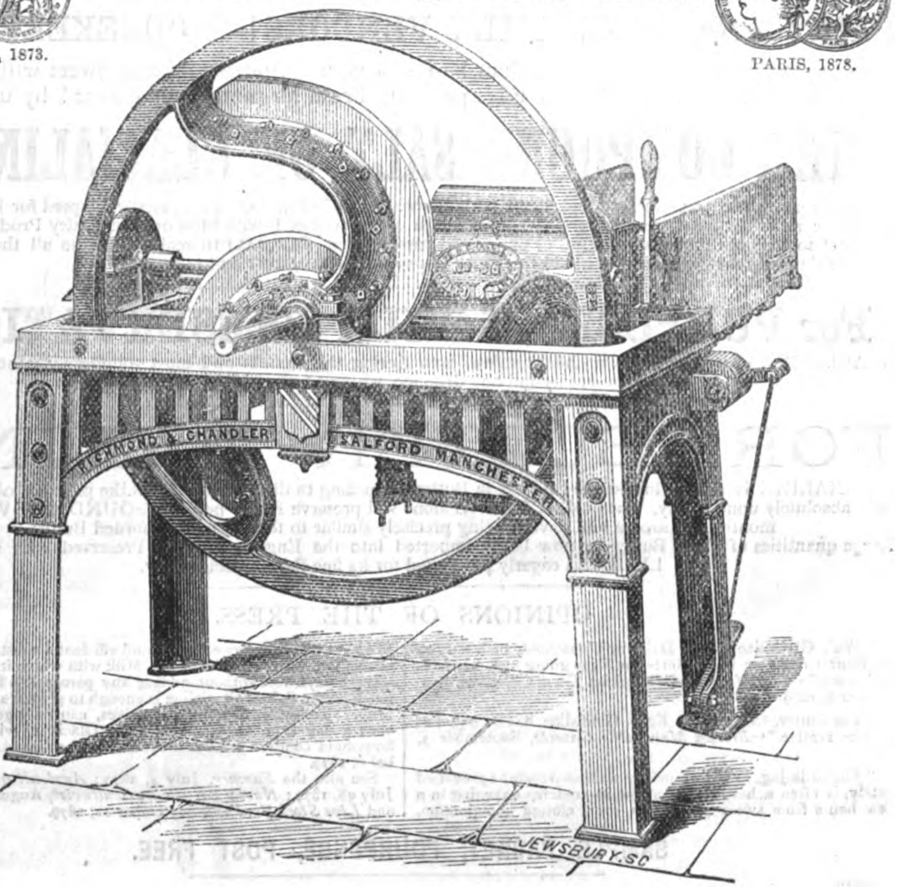
NEWLY IMPROVED CORN-CRUSHING MILLS

VIENNA, 1873.

ROYAL PRIZE HORSE GEAR WORKS,

Patent Steaming Apparatus, &c. &c.

PARIS, 1878.



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At the Meeting of the Birmingham and Midland Counties Horse Show at Acton Park, August 12, 1879, RICHMOND & CHANDLER'S CHAFF-CUTTER was awarded

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The remarkable preservative properties of this preparation of GLACIALINE (specially adapted for Dairy Purposes) are now become almost universally recognized, a single trial of it with Milk or other Dairy Produce being sufficient to convince the most sceptical or prejudiced persons that GLACIALINE really possesses all the qualities that are claimed for it, and that its use in the Dairy is a source of COMFORT and ECONOMY.

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GLACIALINE is at once effectual and harmless, even during the hottest and most thundery weather; so that Milk may be sent by rail any distance, without fear of loss from souring.

FOR BUTTER-MAKING

GLACIALINE is simply invaluable; its use in Butter, according to directions, renders the presence of common Salt absolutely unnecessary, since GLACIALINE alone will preserve Butter perfectly SOUND and SWEET for months, the aroma and flavour being precisely similar to that of newly-churned Butter.

Large quantities of Fresh Butter are now being imported into the English Markets Preserved with GLACIALINE, and eagerly purchased for its fine flavour and quality.

OPINIONS OF THE PRESS.

"With Glacialine in the Dairy or Household, such a thing as Sour Cream or Milk, Butter or Eggs going bad, becomes unknown."—*The Meat and Provision Trades' Review*, September 6, 1879.

"For Butter, Cheese, and Eggs, Glacialine has no equal as a Preservative."—*British Mercantile Gazette*, September 5, 1879.

"The Milk-jug, in hot, thundery weather, such as prevailed lately, is often a household trouble, its contents changing in a few hours from sweet milk into a sour, clotted abomination. We have ourselves tested and found efficient a substance called Glacialine, which preserves the Milk with which it is used for several days, and without adding any perceptible flavour. A pinch of the Salt of Glacialine is enough to preserve a Quart of Milk. To those who, like ourselves, can only get a supply once a day from an adjoining farm, Glacialine will be a real household comfort.—"Rural Notes" in the *Graphic*, September 6, 1879.

See also the *Farmer*, July 4, 1879; *Agricultural Gazette*, July 28, 1879; *North British Agriculturist*, August 27, 1879; and *Live Stock Journal*, September 12, 1879.

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Dairy and Dairy Appliances.

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MESSRS THOMAS BRADFORD AND CO.

The "Midfeather" churn of Messrs Thomas **Bradford** and Co., of High Holborn, London, and **the** Cathedral Steps, Manchester, is too well known and highly appreciated to need lengthened description. Its exterior is illustrated at fig. 92. There is only one beater inside, which fully answers the purpose of more complicated arrangements. The ease with which the churn is cleaned, the simplicity of its details, and its power as a butter-maker, makes it deservedly popular,

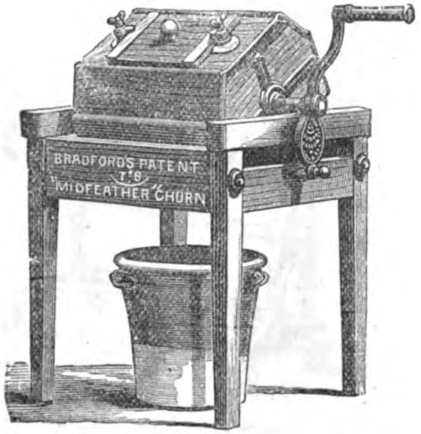


Fig. 92.—Bradford's "Midfeather" Churn.

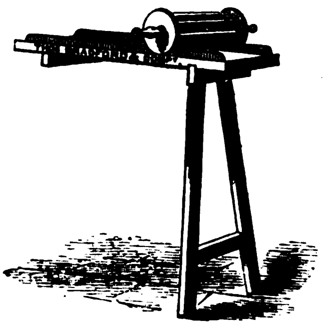


Fig. 93.—Bradford's Board-and-Roller Butter Worker.

Messrs Thomas Bradford and Co. have been among the first to introduce butter workers into the category of useful dairy implements in this country. These machines do away with the necessity of handling butter in any way. They thoroughly and speedily cleanse it, and produce a much better and more marketable sample of butter than is usually made by hand.

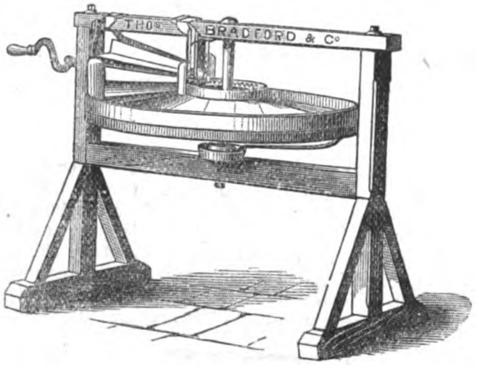


Fig. 94.—Bradford's "Embree" Butter Worker.

The "Board and Roller" butter worker illustrated at fig. 93 is intended for use in small dairies; whilst the "Embree" (fig. 94) is to be especially commended to those who have larger butter-making dairies, and who desire by easy mechanical means to knead butter in a clean and thoroughly perfect manner.

SPAIN'S PATENT (AMERICAN) CEDAR CHURNS.

The awakened demand for improved dairy appliances has led to the introduction of many useful and labour-saving inventions for the dairy from America. Among the more noticeable we may call attention to Spain's prize-medal patent churn, a machine manufactured from fine white cedar—the sweetest wood that can be used for all dairy purposes, and possessing a remarkable capacity to withstand rot under most trying circumstances. Like English models, Spain's churn (see fig. 95) is of the orthodox barrel shape so universally approved of, but here the similarity ceases. As will be seen on reference to the illustration, the barrel of Spain's churns is stationary, but has inside it revolving dashers or beaters (see fig. 96), the form of which, being based on scientific principles, is calculated to be of the greatest possible efficiency, and, as a result, a speedy production of butter is obtained of larger quantity and better quality than is usual in many churns. The dasher frame is set in motion by a handle at the side, and the ease with which it is worked is marvellous. One of the most important merits of the churn is the arrangement of the dasher in combination with the large square top, which enables it to be instantly removed for the purpose of cleansing. The advantage of the large mouth can of itself be readily appreciated by those who have heretofore used the ordinary barrel churn. The stand is made so that it can be folded up and packed away when not required. The whole apparatus is light and strong, and from its great simplicity, ease, and efficiency in working, it will at once recommend itself to intending purchasers of such machines. The agents for the sale of Spain's churns in England are Messrs Lloyd and Co., of 34 Worship Street, London, who keep a large selection of American dairy appliances of the latest and most approved principles.

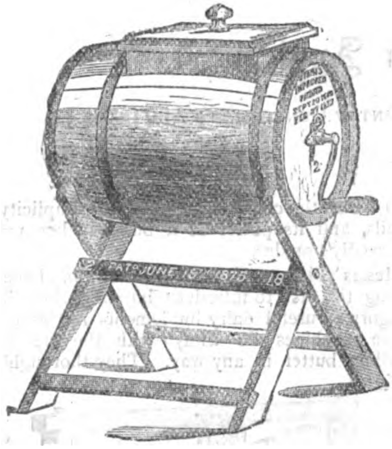


Fig. 95.—Spain's Patent (American) Cedar Churn.

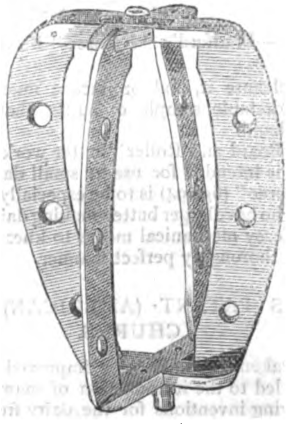


Fig. 96.—Beaters of Spain's Patent (American) Churn.

MESSRS THOMAS AND TAYLOR'S CHURNS.

The churns manufactured by Messrs Thomas and Taylor, of Stockport and Manchester, always attract attention at shows from their novel construction and style of motion, at once suggestive of their practical utility. Their patent Eccentric Churn (fig. 97) is constructed upon scientific principles, and the result, of course, is the production of quantity and quality in butter at the smallest expenditure of power. In Messrs Thomas and Taylor's churns the agitation of the cream is produced, not by beaters alone, but by the rising and falling of the eccentric motion of the box, against the sides of which the cream is forced. The judges of the R.A.S.E., at Bristol, 1878, after careful inspection, and guided by the quality of the butter and the general results of repeated churning trials, gave Messrs Thomas and Taylor the £10 award. Adapted to this churn is a capital self-acting ventilator. The ventilator lets out the air or admits it while the churn is in motion. Hot and cold water can be poured in without stoppage, and the progress of the butter-making be seen. This ventilator is perfectly self-acting, no spring nor any valve being required; and the churn combines the advantages of an open-air churn with all those that the revolving and enclosed churns possess. The ventilator is specially useful for churns worked by power.

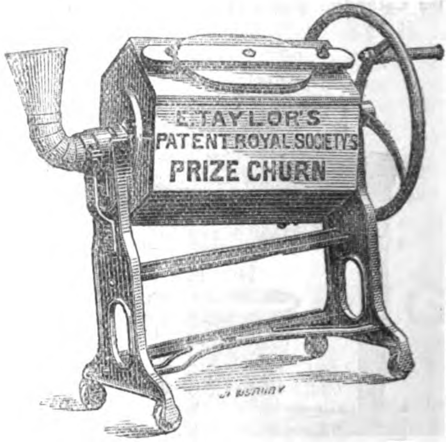


Fig. 97.—Messrs Thomas & Taylor's Eccentric Churn with Ventilator.

MR HATHAWAY'S CHURNS.

Mr George Hathaway, of Chippenham, Wilts, has for many years been well known to the agricultural public as a churnmaker. His improved barrel churn has won many prizes, including a prize at the great churn trial of the Royal Agricultural Society at Oxford a few years ago (when it produced 2 lbs. more butter than any other competitor), and a special medal at the Dairy Show, in the Agricultural Hall, London; also a special medal was awarded by the British Dairy Farmers' Association for the metallic mouth improvements made in this article. The churns are constructed on the latest and most approved principles, combined with newly-invented stopper and beaters. The beaters are constructed on the "Archimedean" principle, by which increased agitation is given to the cream in churning, and a large quantity of butter produced. The stopper, which is perfectly water-tight, forms a most convenient and effective fastening. The cream can be put in and the butter taken out of the churn with the greatest ease, and the churn can be readily cleaned in a few seconds. Each churn is made to revolve on anti-friction rollers; bearings of an entirely new pattern, by which a great saving of labour is effected. There is no friction from iron or brass in the interior to injure or taint the butter. Mr Hathaway pays special attention to the workmanship of his churns, and the best materials and fittings only are used, and a superior finish is given to each article manufactured by him. The churns are made of various sizes, and can be fitted up for steam, horse, or water power if required.

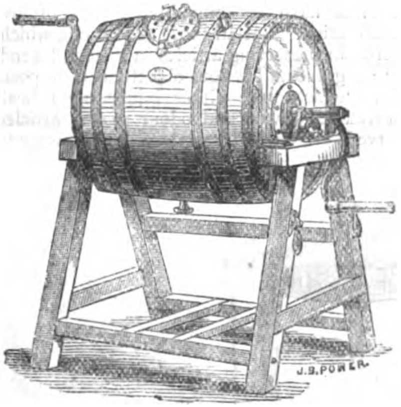
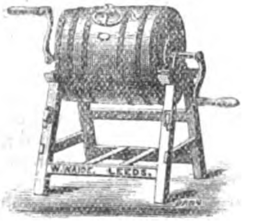


Fig. 98.—Hathaway's Improved Barrel Churn.

MR W. WAIDE'S CHURNS.

Mr W. Waide, of Leeds, has for many years been favourably known as a churnmaker. He never fails to be present in all our great exhibitions, and whenever prizes are awarded for the kind of article he manufactures he meets with a deserved measure of success. The churns manufactured by him are the barrel-shaped. The beaters are perforated and secured in an oblique direction, making the labour of churning easy and producing a very large amount of butter. The bung is also a very important feature in this churn, and is the invention of Mr Waide. The metallic mouthpiece, which in some churns is really necessary, is of no use in this churn, in consequence of the superior method by which the bung is secured. The reason so many bungs are blown out when churning, and much cream wasted, is, they are secured on the outside; but this bung is first put inside of the churn and screwed up into its place, a loose india-rubber washer making the joint, and consequently there is no waste of cream. Other important features in this churn are, they revolve upon anti-friction wheels, an anti-discharge valve, and a catch to hold the churn firm while the cream is being poured into it, and also while the butter is taken out. The best materials, both in wood and iron, are used, and the workmanship cannot be surpassed.


W. WAIDE LEEDS.
Fig. 99.—W. Waide's Barrel Churns.

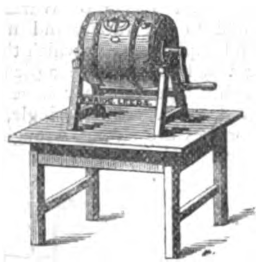


Fig. 100.—W. Waide's Barrel Churns.

MR W. J. HARRISON.

Mr W. J. Harrison, of 208 Waterloo Road, London, S.E., has been awarded several prize medals for the excellence of the dairy utensils manufactured and sold by him. Four prize medals have been awarded to him for his railway milk churns, &c. These churns are made of extra-strong tinned iron, and free from bands or casing or anything that usually gets out of order; it is fitted with malleable cast top, which is practically indestructible, and the churn is one of the strongest, cleanest, and best railway churns made.

Mr W. J. Harrison has also a large assortment of hand cans, cream bottles, measuring tubs, milk pails, measures, strainers, churns, and various other articles in daily use by the country dairy farmer and the town milkman, all well made and of a substantial, useful character.

VIPAN AND HEADLY.

A double milk can and carriage has been designed by Messrs Vipan and Headly of Leicester, which is likely to be of service to dairy farmers and others engaged in the sale of milk. It consists of two milk cans suspended by pivots on a wrought-iron frame fitted with indiarubber buffer springs. It has a seat for driver placed behind, as in a Hansom cab, so that the milk is under his eye, and ascent and descent very easy. In front, between the cans and the horse, there is provision made for carrying cream tins, milk cans, eggs, butter, &c. When required for conveying milk to the station, it can be used with any ordinary railway milk cans; for the dairyman it is fitted with two cans, with locking tops so fitted that the contents cannot be tampered with, and the milk must be delivered to the consumer as it left the dairy. There are arrangements for hanging empty cans, measures, &c. A silver medal was awarded to this carriage at the Manchester, Liverpool, and Lancashire Agricultural Show, lately held at Manchester.

MESSRS CARSON AND TOONE.

Messrs Carson and Toone, of Warminster, Wilts, continue to add to the variety and novelty of the implements and appliances for which they have been so long favourably known to the agricultural world. As makers of cheese-presses they have always been in the foremost rank. Their single, double, and triple cheese-presses are strong, wrought iron being where necessary. They are compact and convenient in form, and the lever principle adopted in their construction is as efficient as it is simple. Some time ago they brought out a new cheese-press for single cheese, and called it the "Liliput." From its small size and low price it is specially suited to the requirements of dairies, both in our own and foreign countries, where small cheeses only are made. They have now introduced the "Double Liliput" (see fig. 101) double cheese-press on the same principle as the "Single Liliput." It is made principally of wrought iron, and will be found a most efficient and economical press for any moderately-sized dairy at home and abroad.

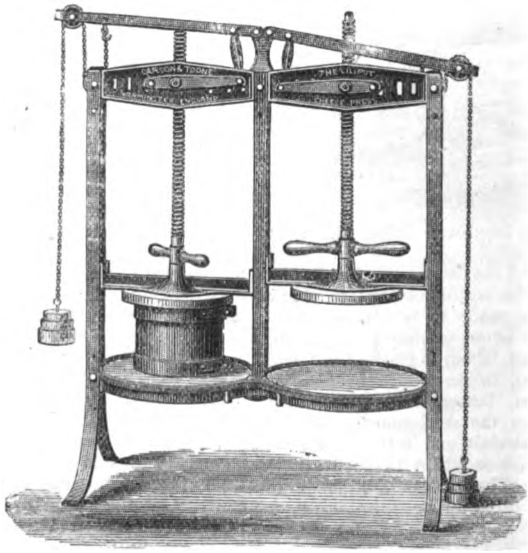


Fig. 101.—Carson & Toone's "Double Lilliput" Cheese Press.

THE ANTITROPIC CO.'S PATENT GLACIALINE.

Since the introduction of glacialine into the dairy world many trashy and impure preparations have sprung up purporting to have the same wonderful preservative power, when applied to milk, cream, butter, and other perishable articles, that glacialine has for over three years been demonstrated to possess. But it is right to inform readers, that since glacialine is protected by Royal letters patent, no one but the Antitropic Company, analytical and manufacturing chemists, 126 Renfield Street, Glasgow, have the right to manufacture this compound, which is the result of extensive and exhaustive investigations into the properties of a long list of substances that have been proved to possess antiseptic tendencies. Sulphurous, salicylic, and other acids and crude substances have an undoubted power of arresting decomposition. But all those substances, which were powerful in preserving articles in a sound condition, had very grave and serious objections from possessing qualities which were either injurious to health or destroyed the flavour and odour of the articles they preserved, or attacked metals, &c., necessary to contain such articles.

The invention of glacialine was proved by competent authorities not to have a single objection in its application to food substances, as it is demonstrated to be perfectly harmless, and does not impart either flavour or odour of any kind to any substance with which it may be used. We would heartily recommend our readers to read the small volume of testimonials (which the Antitropic Company publishes and sends gratis to any applicant) from eminent professors in the medical and scientific world, as well as the experience of a host of witnesses who have used glacialine regularly since its introduction for preserving milk, cream, butter, &c. The perusal of such commendatory testimonials from well-known and reliable parties—including doctors, clergy, nobility, dairy farmers, and business people generally—will serve to verify and emphasize the expression we have several times given of our own personal experience of this article in the dairy. We believe it to be an inestimable boon to the dairy farmers, and think that the Antitropic

Company well deserve the patronage and liberal support of dairy farmers, and all interested in dairy produce, for producing such a useful compound, that enables dairy produce now to be handled in such a way as was never dreamt of by our forefathers.

We would draw particular attention to butter-preserving; and when we state that glacialine preserves fresh butter sweet, sound, and in good flavour for months, without the addition of a particle of salt, we state a wonderful fact; but when it is further announced that tons of fresh butter are sent into the English market from Denmark and other countries preserved in such a manner by the agency of glacialine that even experts in the butter trade fail (as a testimonial shows) to perceive any difference in butter preserved for months from newly-churned butter of the same quality, and cannot detect a trace of any abnormal taste (such as the addition of glacialine), it will be agreed by our readers that it is time that English farmers aroused themselves to a sense of the importance of this question and noticed the revotion which glacialine is capable of performing as an aid to the re-establishment of better times for the farmer and dairyman.

New and Rare Plants.

MESSRS CARTER & CO., HIGH HOLBORN, LONDON.

Messrs James Carter, Dunnett, and Beale, of 237 and 238 High Holborn, are celebrated everywhere as eminent seedsmen, who have gained distinguished honour in many countries besides our own. It is not often given to every firm the faculty of taking away five gold medals at an International Exhibition. This the firm of Messrs Carter and Co. succeeded in doing at the Paris Show in 1878. They were awarded a gold medal for the best models of all kinds of roots, and for collection of seeds; for flowers and ornamental plants they received another; for vegetables also; likewise for forest plants and seeds; and, in addition, in the section for cereals, we should mention, they succeeded in securing the golden stamped coin displaying the worth of their exhibits. We give a description of a few of their special garden novelties worthy the especial attention of our readers.

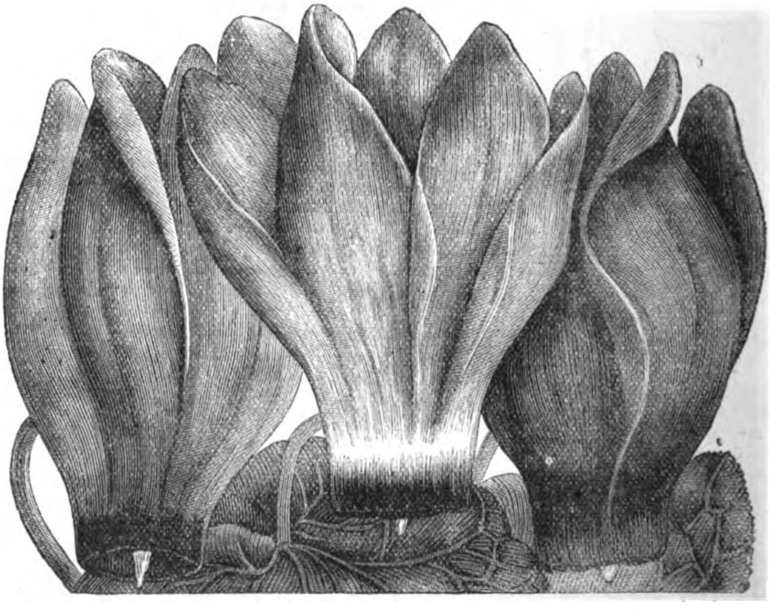


Fig. 102.—Carter's New Cyclamen Grandiflorum.

CARTER'S NEW CYCLAMEN GRANDIFLORUM.

Messrs Carter and Co. have secured the entire stock of these new and beautiful forms of the cyclamen grandiflorum, and which represent the finest strains yet introduced. They have all been submitted to the criticism of the Floral Committees of the Royal Horticultural and the Royal Botanic Societies, and in each case the superiority over other strains in cultivation was acknowledged by the unanimous awards of first-class certificates. Each of the novelties are remarkable for the unusually large size of the flowers, substance, finish, and form of the petals, and for unique brilliancy and attractive colouring.

GODETIA, "PRINCESS OF WALES."

This is a remarkably vivid and brilliant form raised at Messrs Carter and Co.'s St. Osyth Seed Farm, possessing great depth of colour with remarkable neatness of habit. A large mass of this flower at their seed farms last summer presented a gorgeous appearance, resembling at a short distance a breadth of intense crimson velvet. The flowers (which are produced in the greatest profusion) are of a charming ruby crimson, the outer edges of the petals pencilled and shaded with a soft mixture of pale rose and silver grey. Whether as a plant for grouping in the garden or as a pot plant for conservatory decoration it is unique. It is distinct from Lady Albemarle and other sorts

CARTER'S NEW CLARKIA, "MRS LANGTRY."

Messrs Carter and Co. offer for the first time a novel and exceedingly beautiful form of Clarkia, raised at their St. Osyth Seed Farm. The petals have an even edge (*i.e.*, are whole-petalled), the colour of the flower being purest white, with an evenly defined disc or centre of brilliant carmine-crimson. It is distinct from limbata and other varieties. It is remarkably free-flowering, of dwarf, compact habit, and the flowers possess unusual substance. Whether as a pot plant, or for bedding purposes, this pretty novelty will be most welcome, and its easy cultivation specially recommends its use for children's gardens and amateurs generally. Messrs Carter and Co. add significantly that they are favoured with special permission to name this beautiful novelty.

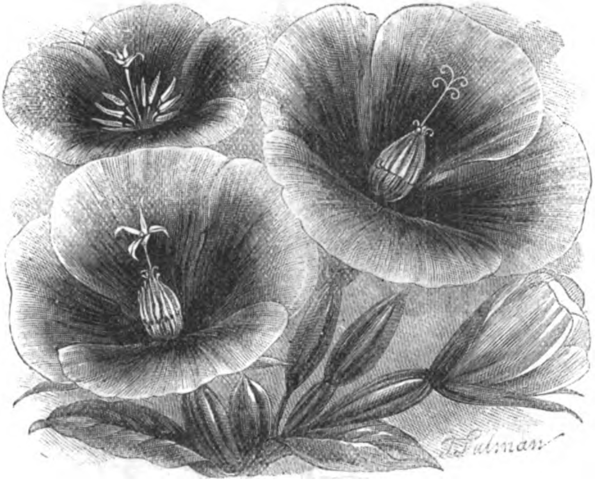


Fig. 103.—Godetia, "Princess of Wales."

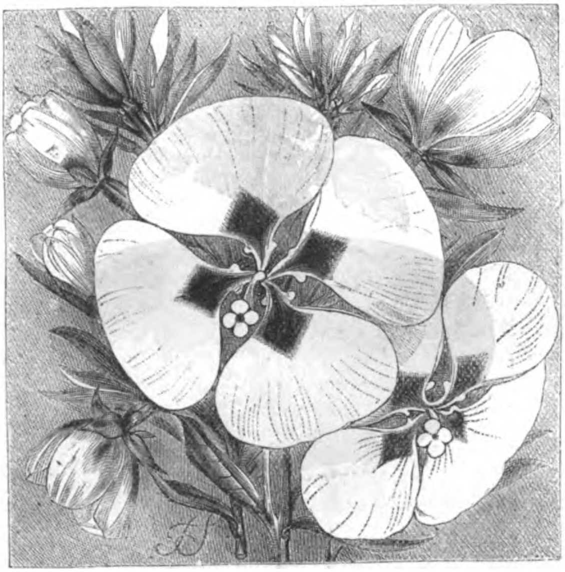


Fig. 104.—Carter's New Clarkia, "Mrs Langtry."

CARTERS' NEW DOUBLE CARMINE SILENE, "ZULU KING."

Messrs Carter and Co. have been for some years selecting this charming double form of brilliant carmine silene, and have at length secured a strain of thoroughly decided character, producing at least 80 per cent. of perfectly double flowers, as shown in the illustration. It is of very compact habit, and may be recommended with confidence as a striking and pretty

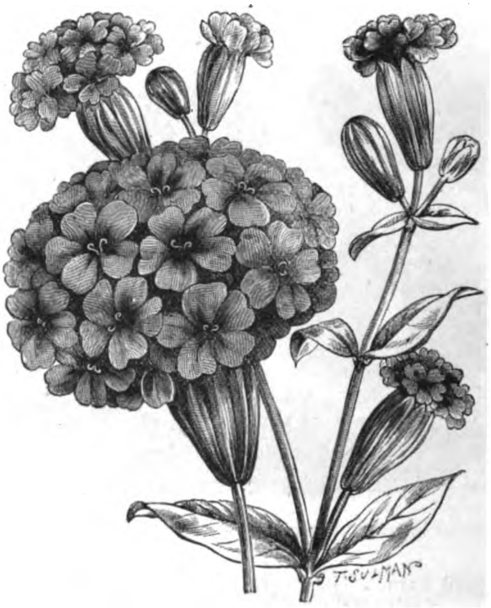


Fig. 105.—Carters' New Double Carmine Silene, "Zulu King."

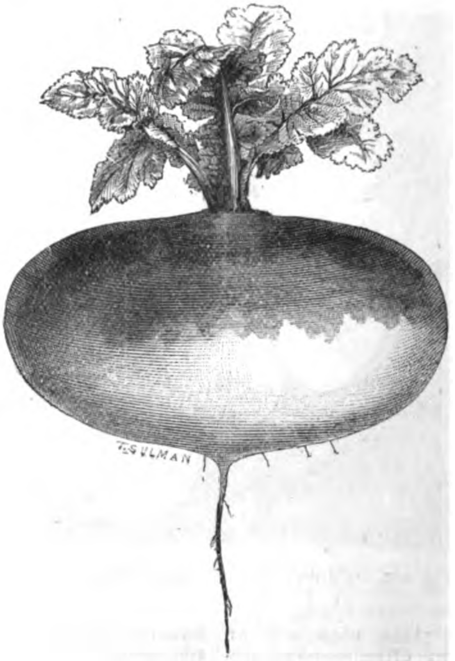


Fig. 106.—New Extra Early Purple-topped Munich Turnip.

novelty, and far in advance of the double silenes already in cultivation.

NEW EXTRA EARLY PURPLE-TOPPED MUNICH TURNIP.

As shown in the illustration, this is a remarkably handsome and very early turnip, with a bright-purplish-red top and fine mouse-tail root. Very distinct and valuable. It has been grown during the past season in the gardens of the Royal Horticultural Society at Chiswick, where it was proved to be quite three weeks earlier than any other variety sown on the same day side by side with it.

CARTERS' DEFIANCE EXTRA EARLY FORCING CAULIFLOWER.

This is for the first time offered as a very distinct and valuable extra early cauliflower. It produces beautiful white heads about the size of a cricket-ball. For forcing or very early use it is not excelled, and it is of a very dwarf and compact habit.

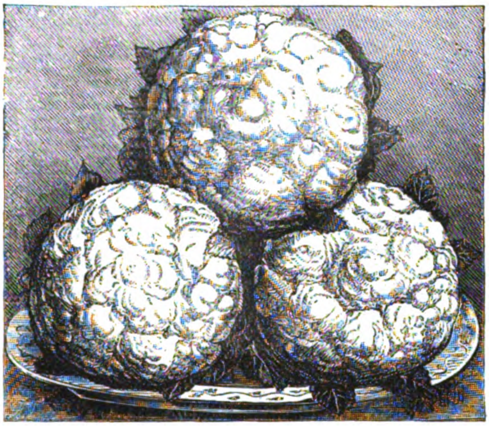


Fig. 107.—Carters' Defiance Extra Early Forcing Cauliflower.

MESSRS SUTTON & SONS, READING.

Messrs Sutton and Sons, the Queen's seedsmen, Reading, are always introducing new and rare plants for farmers, market gardeners, horticulturists, florists, &c. In the introduction of new varieties of edible plants, roots, and tubers their aim is always to push into general cultivation the most prolific and most generally useful kinds. The garden and hothouse flowers are selected from the best stock for their vigorous growth and ornamental appearance. We select a few of their specialties for comment and illustration.

SUTTONS' READING ABBEY POTATO.

This is a seedling which has till now been entirely in the raiser's hands. The chief merits of this potato are—1st. That it has this year entirely escaped the disease, although other varieties in the same fields were almost useless. 2nd. That the crop is, if possible, still larger than is produced by magnum bonum; in fact, we have never known any potato yield so great a crop. 3rd. That the potatoes are of excellent cooking quality, white and very floury, and perfect in shape. The tubers somewhat resemble the old Victoria in shape, but are larger and not so flat. The eyes are well up on the surface. The haulm is perfectly distinct from that of all other varieties. We have no hesitation in saying that Sutton's Reading Abbey combines all the essential points of a good potato. As a very great demand is anticipated, and their stock is comparatively limited, Messrs Sutton advise early orders.

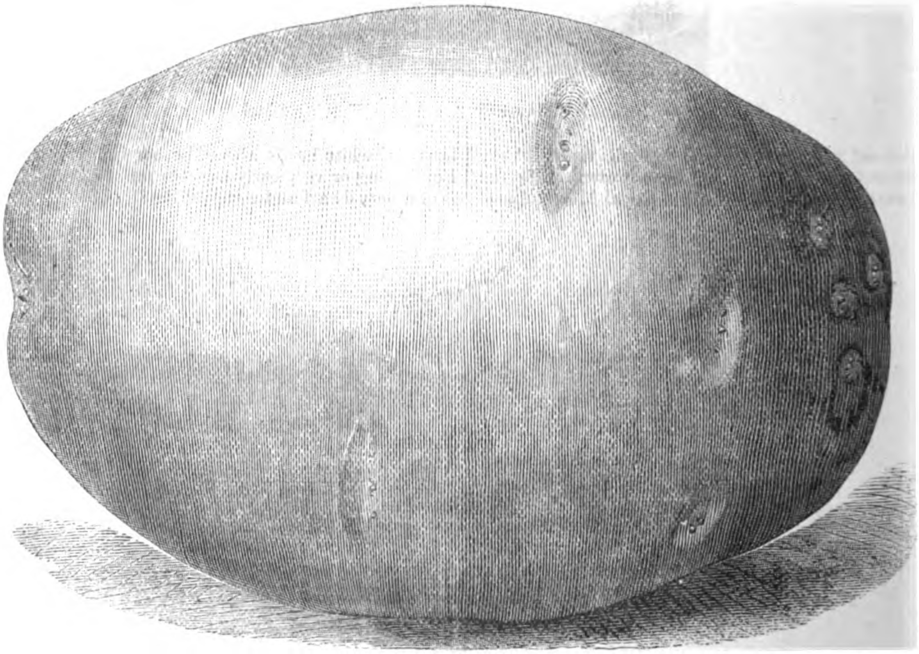


Fig. 108.—Suttons' Reading Abbey Potato.

SUTTONS' MAGNUM BONUM POTATO.

The loss from disease during the past season has probably been unprecedented in the history of potato growing since the first year of its appearance. From all parts of the country have come reports that the ordinary varieties of potato have been almost, if not quite, a complete failure. In former years the disease has been confined more or less to certain districts, but last season it was difficult to say which county had suffered most severely. Notwithstanding this disastrous state of things, it is admitted that wherever planted Sutton's magnum bonum has invariably turned out as fine a crop, or finer, than in the preceding year, and in almost every instance without a trace of disease. We have seen reports in local papers from all parts of the country speaking of the extraordinary merits of this potato, describing it in many cases as the only variety free from disease, all others having been a total failure.

This potato was introduced and named by Messrs Sutton four years since. Previous to that time no such variety was known. It is now undoubtedly the most useful potato for general cultivation, combining great productiveness with excellent cooking quali-

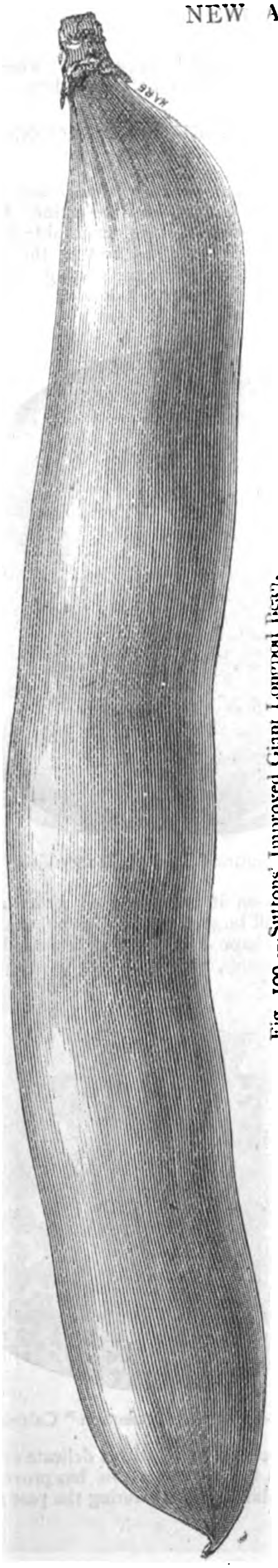


Fig. 109.—Suttons' Improved Giant Longpod Bean.

ties, while its power of resisting disease, and late-keeping properties render it invaluable both for the gentleman's and cottager's garden as well as for field culture. At the International Exhibition, held at the Crystal Palace in October last, ninety-six dishes of this variety were set up, the quality being uniformly excellent throughout the show. At the Paris Exhibition, on October 16, 1878, Messrs Sutton exhibited Magnum Bonum, and were awarded the highest prize medal then given.

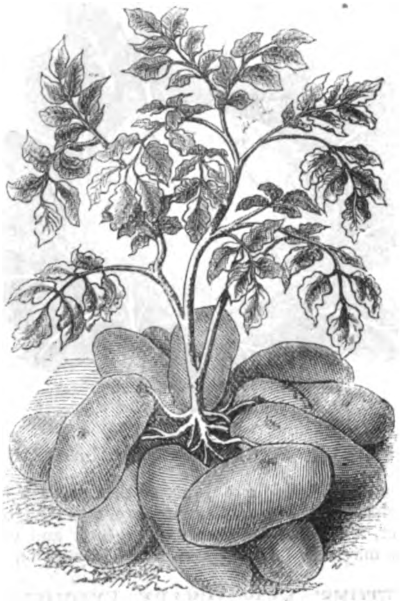


Fig. 110.—Suttons' Magnum Bonum Potato.

SUTTONS' IMPROVED GIANT LONGPOD BEAN.

This is unquestionably the finest stock of longpod bean in cultivation, and is entirely in Messrs Suttons' own hands. It is offered for the first time, and we have no doubt that ere long it will take the place of all other longpod varieties. The pods are perfectly straight, of enormous size, often reaching 12 to 14 inches in length, and are remarkably well filled. It is exceedingly prolific, and in this respect surpassed all other beans at Messrs Suttons' trial farm last year.

SUTTONS' LATE QUEEN BROCCOLI.

This is generally considered the latest broccoli known, and as it fills up the gap which previously existed between late broccoli and cauliflowers, it is invaluable. Late Queen is perfectly distinct from all other broccoli, very dwarf and compact in growth, is rarely affected by frost, and produces splendid heads up to the end of June. The heads are well protected, of medium size, handsome, and of creamy-white colour. Owing to the late period of the year at which it starts seed is scarce. Mr H. Gadd, gardener to the Right Hon. Lord Middleton, says, on May 28: "I am still cutting your Queen broccoli, in fine condition, which, to use the phrase, is shaking hands with the cauliflower, which is now coming nicely." From the *Gardeners' Magazine*, February 1, 1879:—"Suttons' Late Queen is at its best during May, and will continue to yield a supply of good heads until the middle of June, so that given a suitable selection of sorts, sufficient space, and favourable weather, a continuous supply of broccoli and cauliflowers may now be had throughout the year."

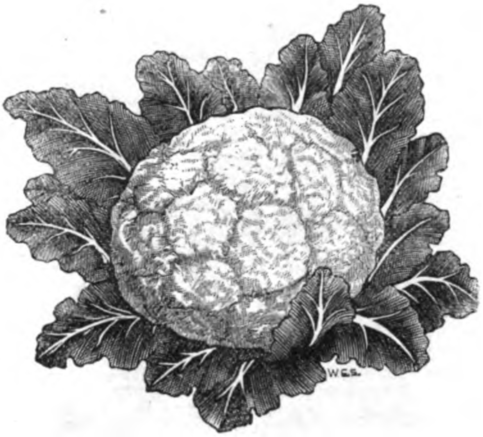


Fig. 111.—Suttons' Late Queen Broccoli.

SUTTONS' NEW DWARF EXQUISITE GREEN CURLED KALE.

This is a new and perfectly distinct variety, differing from all others in habit and curl of leaf. As its name implies, it is dwarf in habit, and so very compact that each plant appears as a mass of most beautifully curled and fringed leaves, which are invaluable for garnishing. It is well adapted for culinary purposes, as it produces a constant supply of greens, which are of excellent quality, and presents an exceptionally beautiful appearance when dished. Strongly recommended for small gardens.

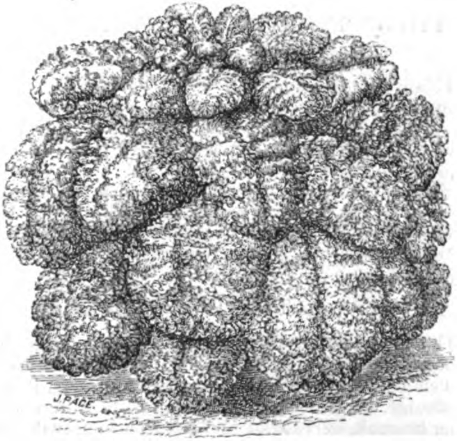


Fig. 112.—Suttons' New Dwarf Exquisite Green Curled Kale.

SUTTONS' EARL OF BEACONSFIELD MELON.

This magnificent melon was sent out by Messrs. Sutton two years since, and has gained high praise from eminent growers. It is remarkable for the freeness with which it sets fruit and in this respect far surpasses any other variety. During the past unfavourable season it has produced remarkably good crops. As will be seen by the illustration the fruit is beautiful in shape and exquisitely netted. Weight from 5 to 8 pounds, rind thin and pale, green flesh, singularly sweet and juicy, with a delicate aroma. In London and in the provinces this has proved a most successful exhibition variety during the past season.

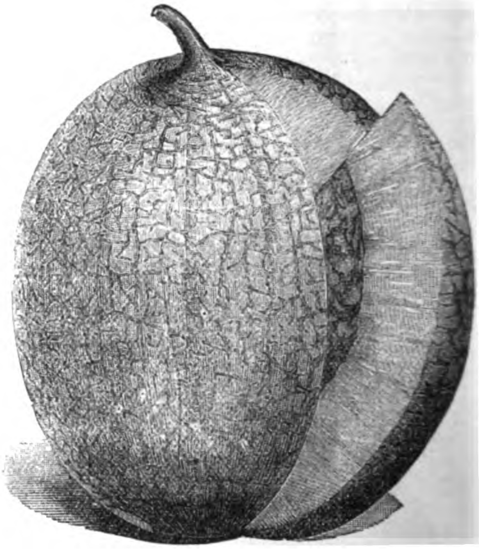


Fig. 113.—Suttons' Earl of Beaconsfield Melon.

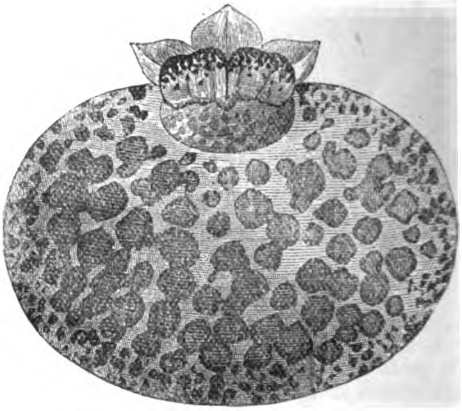


Fig. 114.—Suttons' "Perfection" Calceolaria.

SUTTONS' "PERFECTION" CALCEOLARIA.

The strain of calceolarias distributed by Messrs Sutton have flower-heads of immense size, and are perfect in contour. The flowers, which are borne in huge clusters, are of immense size and of the finest possible shape, and embrace every colour. The yellow ground flowers are, as a matter of course, the most strongly represented, and with their splendid crimson markings are wonderfully effective; and of those with a straw-coloured ground and spotted and marked with purple there are sufficient to make a most pleasing variety. The rose and purple self flowers, some of which are quite new in colour, are also numerous, and present a striking contrast to those spotted with crimson, purple, and rose respectively. Sutton's strain of calceolarias may certainly be said to combine all the good qualities yet found in these attractive flowers.

SUTTONS' NEW GLOXINIA, "CRASSIFOLIA GIGANTEA."

This new strain, which Messrs Sutton have supplied to their customers for the last two years, has given universal satisfaction. Their houses were visited during the flowering period by many experienced gloxinia growers, who greatly admired the size of the flowers and the richness of their colours. The flowers are extremely beautiful, and more than twice the size of ordinary gloxinias. The leaves are so reflexed as to completely hide the pot; hence the plants are specially adapted for table decoration. Messrs Sutton are constantly receiving letters informing them of the extraordinary size and endless variety of colour in the flowers of the gloxinias raised from their seed. Their magnificent collection exhibited at the Kilburn meeting of the Royal Agricultural Society of England attracted great attention. When it is more generally understood that seed sown in January, February, and March will produce large plants with from ten to thirty flowers by July, August, and September, we have no doubt the demand for seed of this valuable strain of gloxinias will be even greater than it is now.

SUTTONS' NEW PRIMULA, "RUBY KING."

This was raised by Messrs Sutton and sent out last year for the first time. The colour is quite distinct from that of any other primula, being of the deepest blood red, with a very well defined bright yellow eye. The habit is more compact than that of any other variety, and the dense mass of flowers stands well up above the foliage. This new primula was exhibited by Messrs Sutton at the meeting of the Royal Horticultural Society on January 14, 1879, when they were awarded a first-class certificate and the large silver Banksian medal.

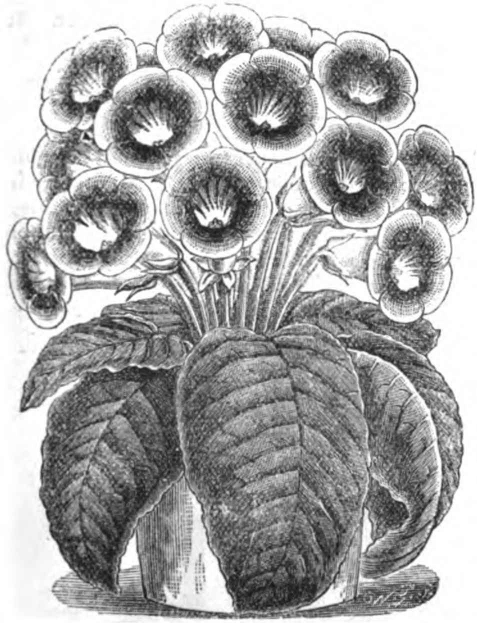


Fig. 115.--Suttons' New Gloxinia "Crassifolia gigantea."

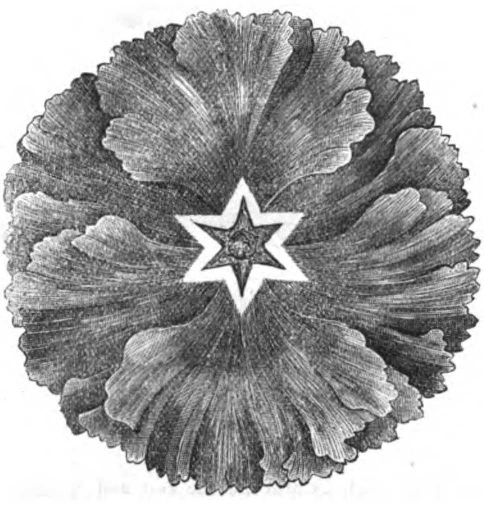


Fig. 116.—Suttons' New Primula, "Ruby King."

Miscellaneous.

MESSRS R. G. PAGET AND SONS.

The past summer season has greatly forced on the minds of agriculturists the advisability of being prepared for a wet day. A great deal of corn and hay is lost every year from the want of immediate covering. The improved waterproof sheets of Messrs R. G. Paget and Sons for use as rick cloths are of excellent material, as also are the cart and waggon sheets prepared by the same makers. Their portable tents (fig. 117), for lawn, garden, boating, and other outdoor pleasure-seeking, are admirably designed, and made of the best material.

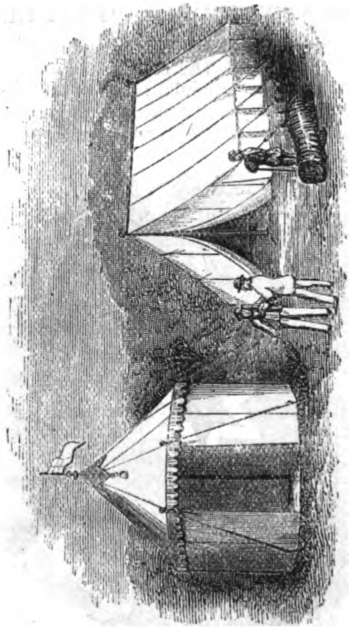


Fig. 117.—Paget and Son's Tents.

MESSRS JOHN EDGINGTON AND CO.'S TENTS.

Messrs John Edgington and Co.'s (48 Long Lane, West Smithfield, London) experience of tent-making is nearly coeval with the beginning of the century. In 1805 they started their business, and they have been patronized by Royalty, by peer and peasant, for tents as well as for preserving cloths, and for trophy flags on great occasions, as well as for those more moderate banners and bannerets which are presumed to give *éclat* to provincial demonstrations. It can safely be said of Messrs John Edgington and Co.'s tents that they are thoroughly waterproof. The marquees for horticultural, floricultural, and agricultural purposes are spacious, and fitted with stages covered with baize. They are easily erected and taken down.

Messrs John Edgington and Co.'s marquees for cricket clubs, archery associations, and other societies of a similar character, are extremely convenient, handy, and lasting; and their square garden tent, which we figure, is a marvel of convenience; chairs and tables are supplied with them, and they can be fitted on framework, so doing away with the central pole.

The patent garden canopy tent is exceedingly easy of erection, and in summer-time one of the pleasantest shades possible under which to enjoy a weed or a glass of sherry, or take shelter from a passing shower. It is moderate in price.

MR WYATT J. PETTITT'S IMPROVED BEEHIVES.

It has always been a matter for regret to all thoughtful persons that the keeping of bees in this country is more systematically neglected than any other industry, and that, in consequence, a most valuable gift of nature to man is ruthlessly and persistently wasted. In 1874, when the British Bee-Keepers' Association was formed, Mr John Hunter declared that for every hive at present in this country there ought to be a thousand, and that for every pound of honey gathered a ton was lost. It appears from some recently gathered statistics that in the United States of America, as in this country, there is a great opening for bee-keeping, and that as compared with other countries (those of Middle and Eastern Europe especially), we are

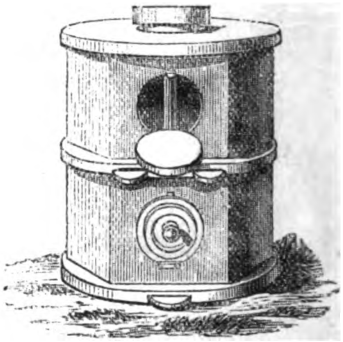


Fig. 118.—Pettitt's *Times* Bee-Master's Hive.

far behind. As the industry is one which hundreds of people can carry on without interfering with their regular occupations, and which might serve to give employment to many now seeking labour, or additional income to many in straitened circumstances, it is worth paying greater attention to the subject than has hitherto been done. It is an industry that is not over-worked or over-crowded, and that offers reasonably large and sure profits, because for its products there is always a demand.

Mr Wyatt J. Pettitt, of the Agricultural Institute, Dover, is the inventor and manufacturer of improved beehives. We wish we were able to illustrate and describe a few of the many ingenious arrangements produced by him, but want of space precludes us from doing justice to the various types—the "collateral," the "temple," the "observatory," the "single box," the "ten frame," and others, and select for the present an illustration of the "*Times* Bee-Master's Hive," of hexagonal shape. This hive has been a most prolific one since its introduction by the "*Times* Bee-Master," in 1864. The inventor recommends that the upper portion be used "purely as a super for the honey available for the master; the slides or dividers to be withdrawn in May, when it is desirable the bees should ascend to their storeroom." The price of this ingeniously-constructed hive is £1 18s. 6d., which would soon pay for itself, if used properly according to the inventor's instructions.

The many arrangements in bee-hives by Mr Pettitt are exceedingly clever and worthy the attention of all bee-masters. The feeders are of various patterns adapted to the different kinds of hives. A square feeder for "collateral" and "temple" hives is one form. Mr. Pettitt's circular feeder is made of wood, with a float, and will hold three and a half to four pounds of food, and is adapted for feeding upon the top of any of the hives. The bees enters through a centre hole, which is about 2 inches in diameter, and being rather lower than the outside rim the bees can pass over to the food when the top is covered with a piece of glass cut to fit over the top. This is decidedly one of the best feeders in use. His patent "new feeder" is illustrated at fig. 119. This feeder is made in mahogany. The bees are admitted only to one half, while the other half serves as a reservoir, into which the food is placed, and which can be replenished by removing the glass cover without a bee effecting its escape. The bees enter through the bottom. The new feeder has proved itself to be a most valuable design. It is highly recommended by practical apiarians.

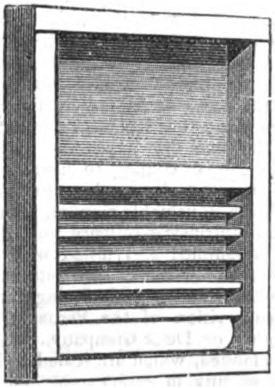


Fig. 119.—Pettitt's New Feeder.

MESSRS ROWATT AND SONS' LAMPS.

The blinding glare of the electric light, the ponderous and costly mechanism required to produce and work it, and the seeming impossibility of economically reducing or dividing the light produced, so that it may serve for the sufficient illumination of comparatively small rooms or spaces, appear to settle the question for the present, that it is not from that quarter that the public are to look for better or cheaper artificial light. Concerning the quality and cost of the light furnished by the gas companies, the less said perhaps the better. There is another source of illumination that has for some years past been growing in public estimation, and is really the most formidable competitor that coal-gas has to encounter, viz. petroleum-gas, that is produced readily, without the help of underground miners, overground stokers and retort-firers, meters, wet or dry, or the laying of miles of main-service, or indoor pipes. All that this kind of oil-gas needs to ensure satisfaction in its use, to get more and better light for less money, is passably pure oil, and well-made lamps and burners. For the fuel the oil-men may be trusted to provide, in their own interests, a good article, or their trade will suffer; concerning the other, inventors tax their powers to produce the peculiar arrangement and construction of lamp, aperture, wick, ratch, and, in a word, burner, that will secure perfect combustion, the complete utilization for lighting or heating purposes of every drop of the oil without the nuisances of smoke or smell. The lamps and burners of Messrs Rowatt and Sons, of London and Edinburgh, that we have seen in almost infinite variety of form and design, seem to combine the maximum of the merits, and the minimum of the defects, just referred to. Their split-wick "Anucapnic" lamp seems to take up every particle of inflammable matter in the oil, and utilize it quite exhaustively. The flame is large, brilliant, white, and clear, yet greatly softer than the light of either the electric light or the coal-gas jet. From what we have seen of the performances of many varieties of their lamps and burners designed for use in ordinary apartments, halls, ball-rooms, churches, and other covered places, we cannot feel surprise that their use is rapidly extending in the United Kingdom, in foreign countries, and in our foreign possessions and the Colonies. Their merits may be briefly summed up, that in almost any country they furnish the means of providing the brightest and best light possible at the least cost in money and trouble.

MESSRS SANDERS AND CO.'S ORNAMENTAL VASES, &c.

Messrs Sanders and Co. have recently purchased the larger part of the models of garden ornaments that have so long rendered famous the firm of Messrs Austin and Seeley, 365 Euston Road, whom they have succeeded in business. The large collection of ountains, which through their long course of fifty years in the trade Messrs Austin and Co. had designed, are adapted, by variety of style and dimensions, to all requirements. Another class of work to which Messrs Austin and Co. had lately devoted much time and ability is deserving of the attention of all whose gardens are suited to the introduction of such subjects. These may be generally described as groups of figures supporting flower vases or baskets, and constituting beautiful centre-pieces to plots of flowers, or as ornaments to the prominent points of terrace balustrading. The prices range from 7 guineas to 35 guineas, about a quarter of what they would cost in carved stone.

Messrs Sanders and Co. have very wisely retained the services of the principal workmen employed by their predecessors; and they explain that as the finish of the ornaments is chiefly executed by manual labour, the quality of the work done depends on the price their customers are willing to pay. Besides the more perishable kind of ornamental designs, they have also a large stock of granite and marble ornaments suitable for all purposes generally required in decorating lawns and gardens. There are few places where one can go with greater probability of having his æsthetic taste in such matters satisfied, than to the well-known and time-honoured establishment in Euston Road.

MESSRS OHLENDORFF AND CO.

Messrs Ohlendorff and Co., 15 Leadenhall Street, E.C., in their "Dissolved Peruvian Government Guano," submit to agriculturists a material that quickly earned universal approval and acceptance, as, whilst preserving a guaranteed amount of the special and original fertilizing virtues of guano, sulphuric acid fixes the volatile carbonate of ammonia, and renders soluble and more efficacious the phosphates. Moreover, uniformity of composition and a dry, powdery condition are attained, and, as in a measured chemist's glass, the exact dose required by the patient under treatment can be given, and its effects regulated. Thus, if the crop is required to make a great effort at a certain stage of growth, the fertilizing, stimulating pressure can be applied at the right moment. Under these circumstances of what may be called adaptability to the skilled agriculturist manipulation, dissolved Peruvian guano has become the cereal and root grower's right-hand power and reserve force.

The opinions of learned experimentalists in regard to either the raw or the dissolved guano form unimpeachable evidence in their favour, and rank both of them as the best farmers' friends, on whom they may confidently rely. As to which side the balance of merit and the balance of cheapness falls, we must refer to the decision of wide practice in their actual use over a variety of crops, on different soils, and in different seasons; and we may conclude this short notice by observing that the array of favourable opinions by those who have used, and who continue to use, the genuine guano as imported and in its dissolved state, fully prove that both deserve and have earned the farmer's complete satisfaction; and when a farmer is satisfied, the gold medal of Paris awarded to Ohlendorff's Dissolved Peruvian Guano can only set its seal to a conclusion in witness that his satisfaction is justified.

RAW PERUVIAN GUANO.

There is an intimate relation between the vegetable and animal world in chemical composition. Guano being produced by the live organism of birds, its different elements are so blended and mixed that the plant finds in it all the nutritive elements it requires from the soil. The production of an artificial manure approaching guano in its variety of valuable constituents would be a matter of considerable difficulty and expense. Circulars and statements were largely issued two or three years ago, setting forth that guano was no longer deserving attention; that, as some of it was now admittedly inferior and various in quality, its sale at a fixed price without any security or guarantee of quality was unfair, and a trading on the faith of its old reputation. And these statements being substantially true at that time, a very serious reduction in the consumption took place. But a salutary change has come about since November 1876, when the present importers—the Peruvian Guano Company (Limited), of 57 Old Broad Street, London, E.C., the sole and exclusive agents of the Government of Peru—succeeded in establishing the principle of selling entirely on the basis of the analysis, thus giving the consumer every assurance and guarantee of the value obtainable. Under this important improvement the sales again largely increased. The popularity of the article has been further much promoted by the fine dry appearance and excellent quality of the cargoes coming to hand. It is of importance to farmers to know that they may revert to the use of this most valuable manure, with confidence, as an article of intrinsic excellence, and of good value. Each cargo is sampled and tested with the greatest care, in order to arrive at accurate results. The method adopted is to lay aside during the discharge, under the supervision of the Peruvian Consul and Sworn Weigher or Dock Company, two bags out of every 400 as landed, which are sealed and reserved to the number of fifty in each cargo. On completion of the discharge these are thoroughly mixed, samples drawn, and analysis completed by Dr Voelcker, the eminent English chemist, whose results regulate the price. The enormous rise in nitrate of soda, the price of which is now above £19 per ton, and in the price of sulphate of ammonia, about £20 per ton will tend to induce farmers this year to further extend the use of Peruvian guano as a well-tried and thoroughly efficient manure.

MR THOMAS BIGG'S SHEEP-DIPPING COMPOSITION.

The sheep-dipping composition manufactured by Mr Thomas Bigg, Leicester House, Great Dover Street, Borough, London, is one that cannot be too highly recommended to flock-masters as a preventive against or for destroying insects to which sheep are liable. The tick or bug which worries the life out of the sheep, prevents them from thriving in mutton, and spoils their wool, is speedily got rid of by using Mr Bigg's sheep-dipping composition; the minute red lice which lurk on the surface of the skin, and are extremely irritating, it kills; it destroys maggot, a most annoying enemy to sheep, especially in wooded districts of country; and the scab is prevented or cured by Mr Bigg's "Specific." The composition was highly approved of by the late Prince Consort, no mean agricultural judge, and it is now used with success and satisfaction in many of the largest and most select flocks in the United Kingdom.

MOLLISCORIUM.

Under the name of Molliscorium, Messrs Vanner and Prest, 148 Ormside Street, Hatcham, S.E., sell a preparation for softening and preserving leather. It is particularly recommended for use in the saddle-room and for application to harness, carriage-tops, aprons, &c., as well as for oiling carriage axles and agricultural machinery. It readily penetrates leather, rendering it soft and waterproof, and ensuring its durability. It has the advantage over many other oils, that harness can be polished with "compo" immediately after Molliscorium has been rubbed in. It does not evaporate even at 600 deg. Fahr.; consequently, when once it enters the leather it remains there, keeping it supple and waterproof. Harness, saddles, bridles, hunting-boots, &c., after the Molliscorium has been applied, if kept in stock or left lying by for years, will not deteriorate. When applied to carriage axles it keeps them well lubricated, and it is a perfectly clean preparation.

VARNISHES, COLOURS, &c.

Messrs Denton and Jutsum, of 8 New Broad Street, E.C., are celebrated as manufacturers of varnishes, japans, paints, &c. Their mixed paints are manufactured of every shade of colour, and conveniently made up in tins of 3 lbs. each and upwards ready for immediate use. These paints require no mixture or addition of any kind. The most inexperienced can use them, and being hermetically closed, they remain unaffected by climate or length of time. The "anti-corrosive" colours will stand any exposure without blistering or peeling, and the "metallic oxide" paints when applied to iron entirely prevents the corrosion of the metal. Messrs Denton and Jutsam's enamelling paints dry with a rich gloss, and are especially valuable for decorative purposes. Their varnishes and japans for brilliancy, durability, and general excellence are highly recommended and extensively used.

CALVERT'S CARBOLIC ACID PREPARATIONS.

The carbolic acid and its preparations manufactured by Messrs F. Calvert and Co., of Manchester, have been of immense service to the world. As a disinfectant in the household, in the farmyard and stables, carbolic acid is well known for its powerful influence. It is most valuable in cleaning and purifying from infection cowsheds, stables, piggeries, &c. In the treatment of wounds for rot and foot-and-mouth disease it is a singularly efficacious remedy. Sheep can be cured of scab or freed from parasites by use of Calvert's carbolic wash, which is of guaranteed strength, mixes readily with water, and improves the fleece without causing loss of weight. And Mr Henry Woods, agent for Lord Walsingham's estate, has lately drawn attention to its great value as a remedy for straining in ewes after lambing, and he has by doing so conferred an inestimable boon on the flockmasters of the United Kingdom. Furthermore, the carbolic wheat dressing prepared by Messrs F. Calvert and Co. has added to the long list of services they have rendered to the public in introducing carbolic acid and its various preparations to the public.

CLARKE'S CARBOLIZED WHEAT PROTECTOR.

Protection for Farmers is offered, at least in one form, to which all parties agree. This is in the carbolized dressing for wheat, which protects the seed from birds, slugs, grub, or wireworm. The list of first-rate agriculturists who use it includes the names of Mr Beck, the Sandringham agent to H.R.H. the Prince of Wales, and those of well-known farmers in all our chief wheat-growing districts. The use of it, to our own knowledge, has given general satisfacfaction in Kent. This present seed-time, of all others, is one when it is necessary to give grain every chance of a fair, healthy start, and Clarke's Carbolized Wheat Protector is, besides, an acknowledged safeguard, a stimulator that brings the plant up early and strong. A writer, who sends a testimonial in favour of the dressing for keeping the crop free from smut, adds a new word to the dictionary when speaking of it as a bird-*disguster*; a phrase that is too downright and expressive to be overlooked. We can fancy the birds in council anathematizing the carbolic compound as the old monks condemned mediæval sinners. Here we would ask Mr Clarke—What is a rook? is he really a parson? because he states that when seed-grain is dressed with his chemical preparation "neither birds *or* rooks will touch it." Plainly a rook must therefore be something *more than a bird*. But no matter whether, like the Raven in Edgar Allan Poe's poem, he be "bird or devil," Clarke's carbolized dressing is too much for him, and he leaves the good seed to germinate and increase a hundredfold if the season gives it a fair chance. The efficacy of this dressing has been tested now through more than a score of years, and, as the cost is about *one penny to a bushel* of seed, we recommend those who have *not* tried it to do so; those who *have* used it will do so again without recommendation.

DOWN AND CO.

Messrs Henry Down and Co., Woburn, Bedfordshire, for preventing smut in wheat, which is now supplied carbolized, making it most efficacious as a dressing for barley, oats, and other spring corn in protecting it from the attacks of rooks and vermin. The "Farmer's Friend" is so extensively used by

English, and also by the principal Continental agriculturists, as manufactured by this old-established firm, that we need add nothing more to recommend its use by those who are not already acquainted with its merits.

BRADBURY'S SHEEP-DIPPING POWDER.

Of the numerous sheep-dipping preparations that of Messrs S. Bradbury and Co., Limited, of the Tranmere Chemical Works, Birkenhead, is highly spoken of as a certain, safe, and effectual cure for scab, destroying all the tick and lice, stopping the fly, cleaning and promoting the growth of the wool and health of the sheep. It may be used with equal success upon every kind of sheep in every part of the globe at all seasons of the year. It is a most valuable dip for lambs; it effectually frees the skin of all insects, enabling them to feed with comfort and gather flesh rapidly. It is soluble in cold water, is perfectly uniform in strength, it does not stain the wool; can be used also for smearing or pouring with oil or grease in winter or cold climates. It is also a very cheap dip, costing less than one halfpenny per sheep —a considerable saving in large flocks. It has a very influential patronage, and is worthy the attention of our home and colonial wool-growers.

MESSRS TOMLINSON AND HAYWARD, LINCOLN.

Stock farmers and others should not fail to make an inspection of the exhibits of this old-established firm, more especially of their "Glycerine Dip," which was introduced in 1866, and has since then earned a well-merited notoriety for the cure and prevention of scab and all skin diseases. This preparation commends itself in an especial manner to the notice of farmers on account of its non-poisonous nature. It stimulates the growth and improves the quality of the hair and wool, and is at the same time a deadly enemy to all parasites. A small pamphlet explanatory of its use, and giving the experiences of those who have tried it, can be obtained on application of the proprietors. The "Butter Powder" exhibited by this firm is intended to remove from butter all flavour unpleasant to the taste, and likewise is said to reduce the time occupied in churning.

The "Luddington Oils" are also shown by Messrs Tomlinson and Hayward. They have been used for nearly a century by many well-known farmers, who have on many occasions expressed their satisfaction.

ELLIMAN'S ROYAL EMBROCATION.

It is now twenty-eight years since this well-known embrocation for horses and cattle was introduced to the notice of the public. The fact of the embrocation having been used with success for many years in the stables of the Duke of Somerset, the Duke of Buccleuch, Marquis of Huntly, Marquis of Bute, Earl of Yarborough, and other well-known noblemen and gentlemen, is a guarantee of the general efficacy of the Royal Embrocation in cases of sprains, sprung sinews, chapped heels, capped hocks, broken knees, sore backs and shoulders, sore throats, cuts and wounds, &c. The reputation which it enjoys as a valuable specific for the cure of numerous ailments of our domestic animals, should justify the live stock owner in at least giving it a trial, not only in the treatment of the diseases of horses and cattle, but also those of sheep.

THORLEY'S ORIGINAL FOOD FOR CATTLE.

This condiment has been known to the public for a quarter of a century. It is used in improving the food of horses, oxen, cows, calves, sheep, pigs, dogs, poultry, game, rabbits, &c. An idea may be obtained of the extent to which this condiment is used in improving the food of live stock when we state that at the last Smithfield and Birmingham fat cattle shows 453 animals there exhibited were fed on Mr Joseph Thorley's preparation. It is claimed for it that horses and cattle thrive admirably on food seasoned with this condiment, while sheep and pigs retain a healthy appearance when constantly fed with it, and put on flesh rapidly in fattening. Lambs, it is said, improve greatly by having meal impregnated with Thorley's food placed outside the lambcreep. Mr Joseph Thorley, Caledonian Road, London, exhibits at Smithfield Show (Stand 59).

MR CHAMBERLIN'S DOG AND POULTRY FOODS.

Mr James Chamberlin, of Norwich, has added to our stock of dog and poultry foods. His Canadian poultry meal and granulated dog food are highly spoken of. The poultry meal is much recommended by breeders and exhibitors of turkeys, geese, ducks, &c., and the meat biscuits for dogs is a palatable food, easily digested, and abounding in nutritive qualities. Preparations like those submitted to the public by Mr Chamberlin are most useful to town or country folks fond of poultry and of the more companionable creature—the dog.

MESSRS HAYHOE AND CO.'S PATENT SOLVENT.

The name of "Patent Solvent" has been adopted by Messrs James Hayhoe and Co., of Stowmarket, to distinguish a preparation of their own for removing paint, varnish, or japan from wood, iron, or stone, whether these have been accidentally or purposely coated with paint, &c. It also dissolves distemper on walls or ceilings, and is useful in removing wall-paper for purposes of re-decoration. It is equally efficacious in removing ink or grease from stone. Not being of a caustic nature, it does not injure the brushes used or the material with which it is brought into contact. Mr T. G. Carpenter, of the surveyor's office, Bank of England, speaks highly of it. He says: "I can confidently recommend it, and consider that it only requires to be known to be more generally used"—a statement which speaks forcibly in its favour.

MISCELLANEOUS

MESSRS WEBB AND SON.

At Combs Tannery, Stowmarket, Messrs Webb and Son carry on several allied industries, as tanners, curriers, fellmongers, glove-leather dressers, and manufacturers of leather machine-bands, fire-buckets, and hose. One of the staple articles of such a business is, of course, sole-leather, and they have brought it to a high state of excellence. They have succeeded in producing an article of immense thickness, impervious to wet, beautiful in colour, and solid as a board. A lighter variety of the article is suitable for the soles of ladies' boots. All the other kinds of leather required by the shoemaker, currier, saddler, and harness-maker, including calf-skins, horse-hides, and harness-hides, are the results of various processes. There is another speciality—namely, leather machine-bands—in which the firm stands pre-eminently conspicuous, having secured medals for it in almost every country where exhibitions have been held. This article is prepared in a way peculiarly their own, and their success largely depends on their having effectually obviated the too common defect, which subjects mill-owners to the detriment of stopping work because of the belt unduly stretching, and consequently running crooked.

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THE STANDARD LIFE ASSURANCE COMPANY.

ESTABLISHED 1825.

DIVISION OF PROFITS, 1880.

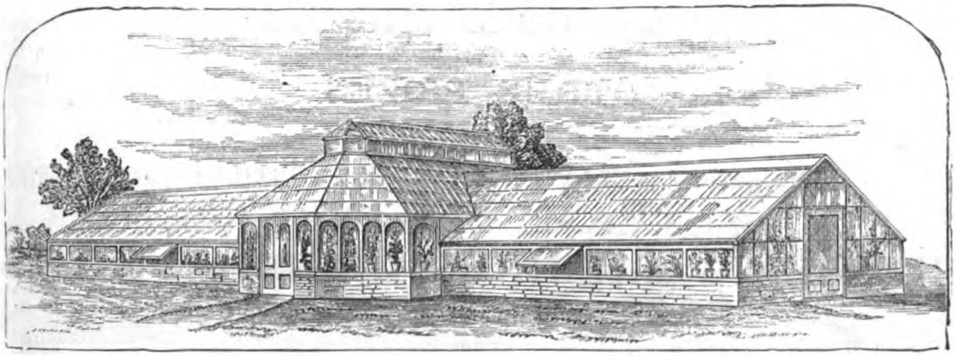
The TENTH Division of Profits will take place after the close of the books for *the current year*, and all Policies taken out previously will be entitled to share in the fund to be divided, being the profits realised since the last distribution five years ago. The present year is thus an unusually favourable one in which to effect a Policy with the Standard.

EXISTING ASSURANCES—Nineteen Millions Sterling.
ANNUAL REVENUE—Eight Hundred Thousand Pounds Sterling.
INVESTED FUNDS—Five Millions and Three-quarters Sterling.

Edinburgh: 3 GEORGE STREET.
London: 82 KING WILLIAM STREET, E.C.

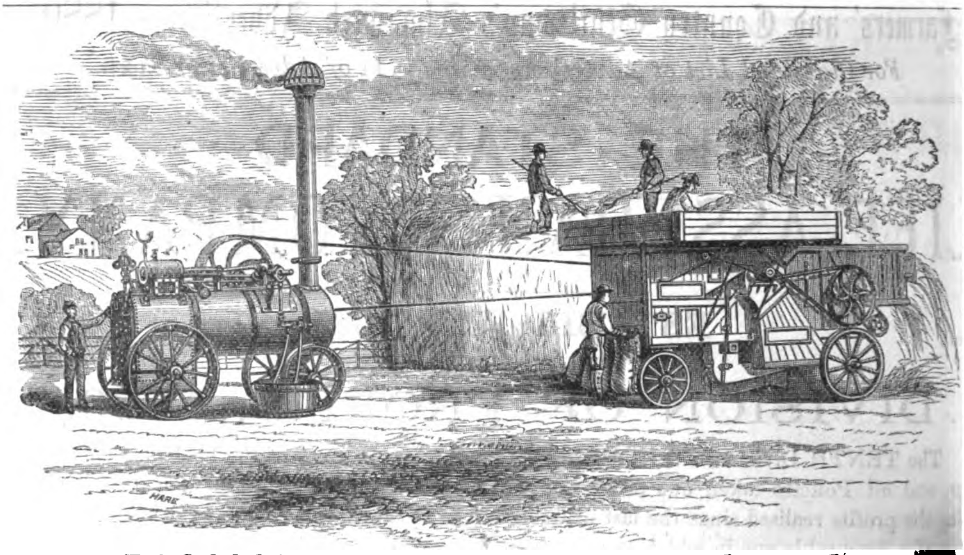
As Adopted for H.R.H. THE PRINCE OF WALES at Sandringham.

HELLIWELL'S PATENT SYSTEM OF GLAZING WITHOUT PUTTY.



No outside painting. Cost of house saved in 12 years. Perfectly watertight. No rattle of looseness of squares. Squares easily removed. Requires no more heating than a putty roof.

T. W. HELLIWELL,
Brighouse, Yorkshire, & 19 Parliament St., London.



RICHARD GARRETT & SONS,
LEISTON WORKS, SUFFOLK, ENGLAND.
ESTABLISHED ONE HUNDRED YEARS.

SPECIALITIES.
PORTABLE ENGINES, FIXED ENGINES, TRACTION ENGINES,
THRESHING MACHINES, DRILLS,
HORSE HOES, AND MANURE DISTRIBUTORS.

CLAYTON & SHUTTLEWORTH,
STAMP END WORKS, LINCOLN, & 78 LOMBARD STREET, LONDON.

TWO GOLD MEDALS
AND
OTHER PRIZES

Were awarded to CLAYTON & SHUTTLEWORTH for their
STEAM ENGINES,
THRASHING MACHINES, GRINDING MILLS,
TRACTION ENGINES, &c.,
AT THE
PARIS EXHIBITION, 1878.
CATALOGUE FREE ON APPLICATION.

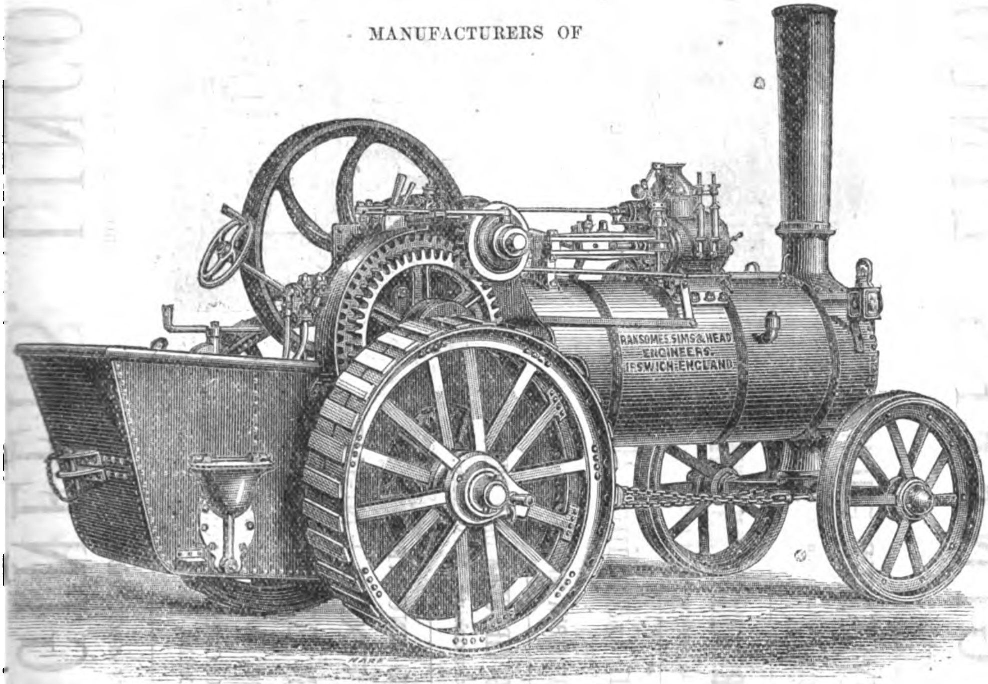
☞ **The Royal Agricultural Society of England** have awarded **First Prizes** to **Clayton & Shuttleworth** at every meeting at which they have competed **since 1849.**

For Classified List of Advertisers, see page 44 of Advertising Sheet.

RANSOMES, SIMS, & HEAD,

ORWELL WORKS, IPSWICH,

MANUFACTURERS OF



AGRICULTURAL LOCOMOTIVE ENGINES.

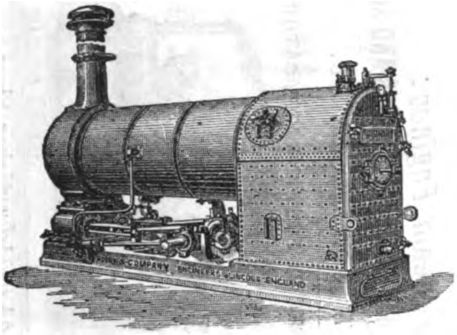
These Engines are made from entirely new designs and patterns, embodying many improvements. They are fitted with two speeds, the cylinder is steam jacketed, the crank shaft bearings re supported on strong wrought-iron brackets firmly bolted to the boiler. The driving wheels re of wrought iron, and the axle is geared direct to the intermediate shaft. A winding drum with 60 yards steel rope can be attached, also compensating gear when required. Several of hese Engines are in use in Scotland, giving great satisfaction, and the highest Testimonials have been received from the owners. R. S. & H. also manufacture

Portable, Vertical, and Stationary Steam Engines;
HRASHING MACHINES AND DRESSING MACHINES; PLOUGHS FOR ALL PURPOSES AND SOILS;
Horse-Rakes and Haymakers; Lawn Mowers, &c. &c.

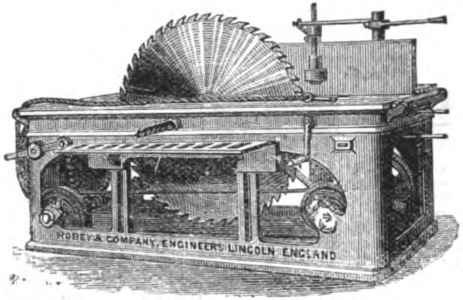
COMPLETE ILLUSTRATED PRICED CATALOGUES FREE BY POST ON APPLICATION.

RANSOMES, SIMS & HEAD.
IPSWICH, ENGLAND.

ROBEY & CO., ENGINEERS, LINCOLN.



PATENT 'ROBEY' FIXED ENGINE.



SELF-ACTING CIRCULAR SAW BENCH.

Sole Manufacturers

OF THE

PATENT 'ROBEY' FIXED ENGINE,

Which saves all expensive foundations and high brick chimney.

SUPERIOR PORTABLE ENGINES,

Most economical in consumption of fuel.

Improved Corn-Grinding Mills,

AND

EVERY DESCRIPTION OF FLOUR-MILL MACHINERY.

IMPROVED SELF-ACTING CIRCULAR SAW BENCHES,

And other Wood-working Machinery.

VERTICAL ENGINES,

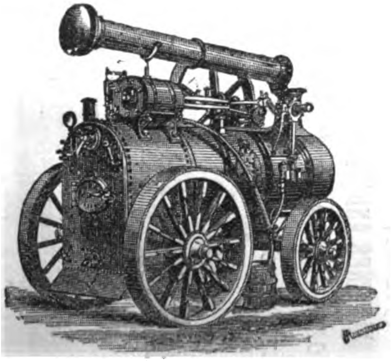
HORIZONTAL FIXED ENGINES,

TRACTION ENGINES,

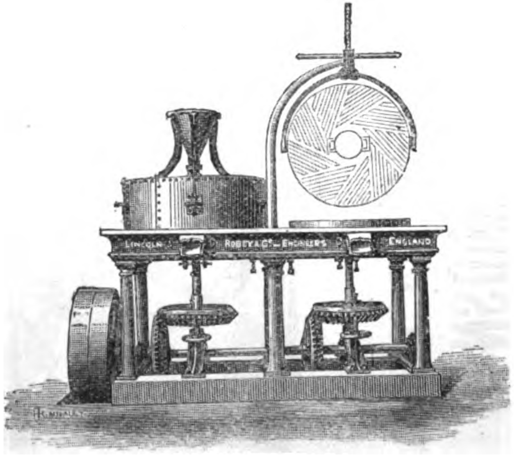
Patent Iron Framed Thrashing Machines,

AND ALL KINDS OF MACHINERY FOR FARMERS, LANDOWNERS, &c. &c.

For full Particulars and Prices apply to



SUPERIOR PORTABLE ENGINE.

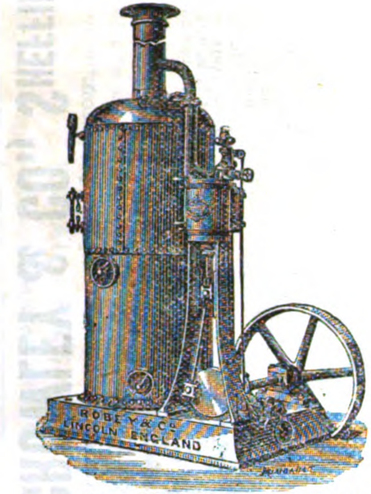


IMPROVED CORN GRINDING MILL.

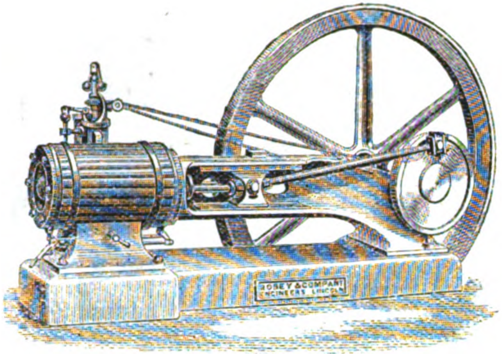
ROBEY & CO., ENGINEERS, LINCOLN.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

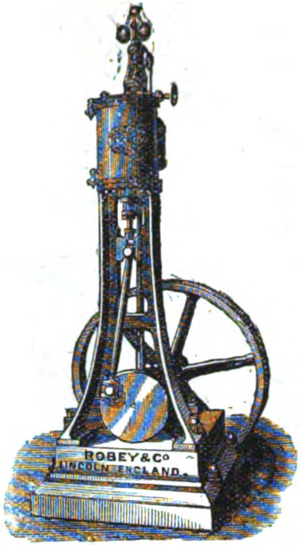
ROBEY & CO., ENGINEERS, LINCOLN.



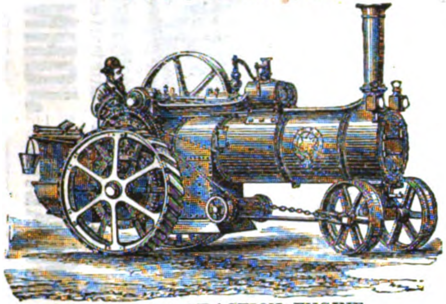
VERTICAL ENGINES & BOILERS,
From 1½ to 12 horse power.



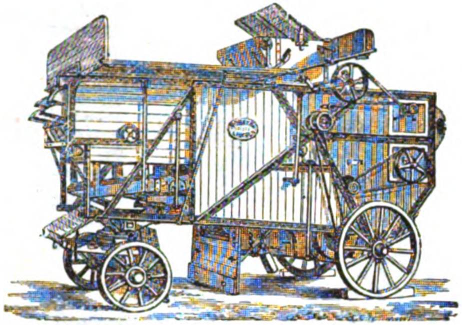
IMPROVED HORIZONTAL FIXED STEAM ENGINE,
4 to 60-horse power.



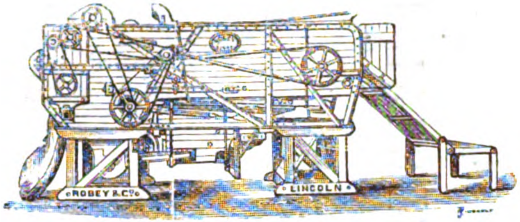
VERTICAL ENGINES,
From 1½ to 12 horse power.



IMPROVED TRACTION ENGINE.



IMPROVED THRASHING MACHINE.



PATENT 'ROBEY' FIXED THRASHING MILL.
Of all sizes,

For full Particulars and Prices of the Machinery herein illustrated apply to the Sole Manufacturers,

ROBEY & CO., ENGINEERS, LINCOLN, ENGLAND.

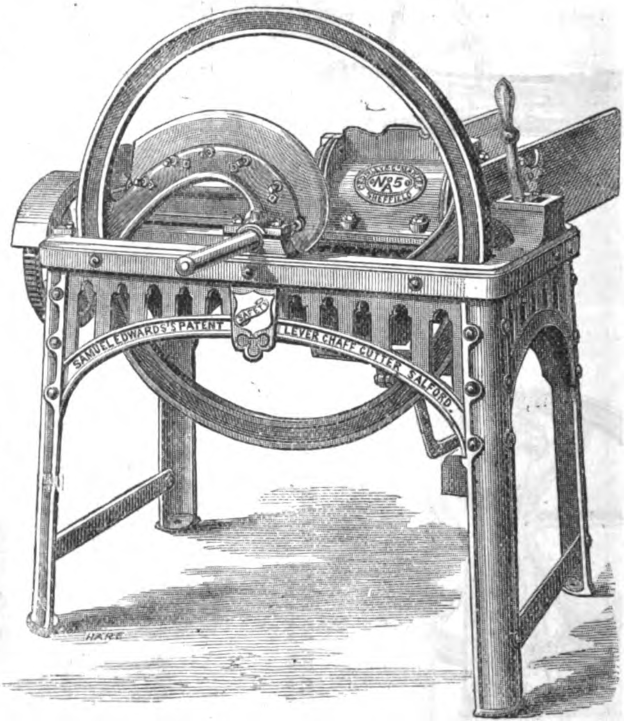
☞ The only **GOLD MEDAL** for Chaff Cutters

AWARDED AT THE

UNIVERSAL EXHIBITION, PARIS, 1878.

IN COMPETITION WITH ALL THE WORLD.

SAFETY LEVER CHAFF CUTTERS
(S. EDWARDS'S PATENT.)



THE ONLY CHAFF CUTTERS WHICH CAN BE STOPPED, THE FEED REVERSED, AND THE LENGTH OF CUT CHANGED BY MEANS OF ONE LEVER.

THE 'INVINCIBLE' LAWN MOWER

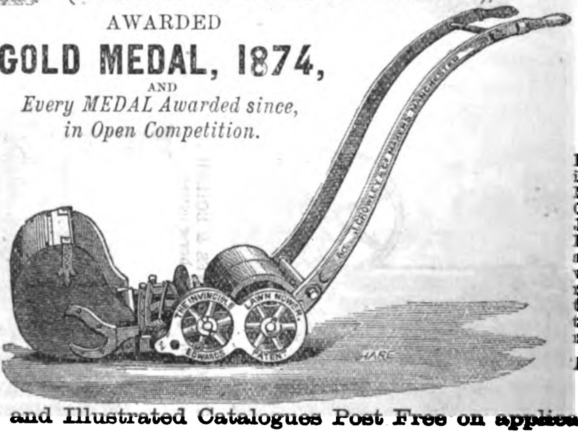
(SAMUEL EDWARDS'S PATENT),

AWARDED

GOLD MEDAL, 1874,

AND

Every MEDAL Awarded since, in Open Competition.



TESTIMONIAL

(Out of numbers we have received).

From CHAS. ABBOT PETERS, Esq., Claremont, Henleaze Park, Westbury-upon-Trym, near Bristol, June 13, 1877.

'The large Lawn Mower you supplied me with some time ago is the best Lawn Mowing Machine I ever had, far better than any English and American ones I formerly used.'

LAWN MOWER CONTEST.

The most crucial trial of Lawn Mowers ever known in this country was at the National Lawn Mower Contest in Birmingham, July 8, 1874, when the Premier Gold Medal was awarded to Samuel Edwards's 'Invincible.' The result proves conclusively that it is, without exception, the best Lawn Mower made.

Every Machine guaranteed.

Prices and Illustrated Catalogues Post Free on application.

SOLE MAKERS—JOHN CROWLEY & CO., SHEFFIELD.

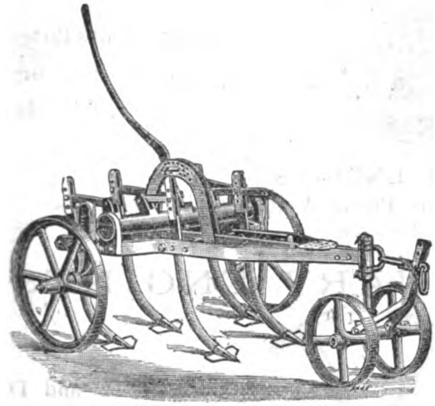
For Classified List of Advertisers, see page 44 of Advertising Sheet.

COLEMAN & MORTON,

LONDON ROAD IRONWORKS,

CHELMSFORD.

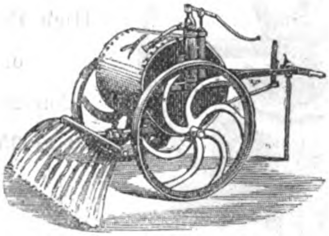
COLEMAN'S CULTIVATOR has Won 150 FIRST PRIZES.



Vienna Exhibition, 1873—'Grand Medal for Merit.'

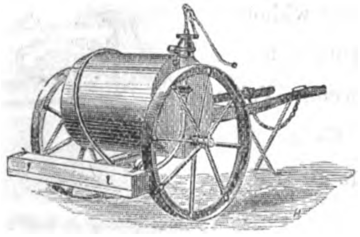
Paris Exhibition, 1878—TWO Prize Medals.

In place of the single wheel and span iron, or crotch, which support the fore part of the implement, a *pair* of wheels is adopted, one of which is pinned to a steel axle, the other being loose. The axle revolves in a suitable bearing, entirely preventing any wear in the bosses, and giving great steadiness to the implement. This arrangement also considerably lightens the draught.



HAND WATER-CART AND GARDEN ENGINE,

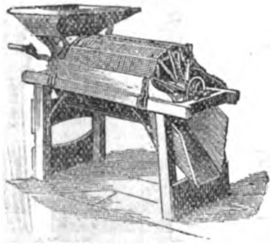
For use in Gentlemen's Gardens and Grounds.
Holds 35 gallons.



Paris Exhibition First Prize.

WATER AND LIQUID MANURE CARTS,

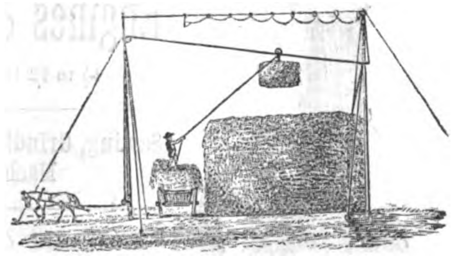
In various sizes and for all requirements.



PATENT ADJUSTABLE ROTARY CORN SCREEN.

Awarded Eight Silver Medals.

Suitable for all kinds of grain; not liable to get out of order. Saves clear 2*s.* per qr. on Barley.



PATENT HORSE PITCHFORK OR ELEVATOR.

For saving labour in unloading and stacking Hay, Straw, and Corn, its value can scarcely be overrated

ROYAL PRIZE HOP SYRINGING MACHINE.

Catalogues and Testimonials on Application.

MARSHALL, SONS, & CO., Limited,

BRITANNIA IRON WORKS, GAINSBOROUGH.

3 KING STREET, CHEAPSIDE, LONDON, E.C.

PORTABLE ENGINES.

$1\frac{1}{2}$ to 35 H.P.

Very strong, simple in design, and economical in fuel.

Royal Society's First Prize

THRASHING MACHINES

Fitted with Marshall's Patent Safety Drum Guard, or Patent Safety Self-Feeder.

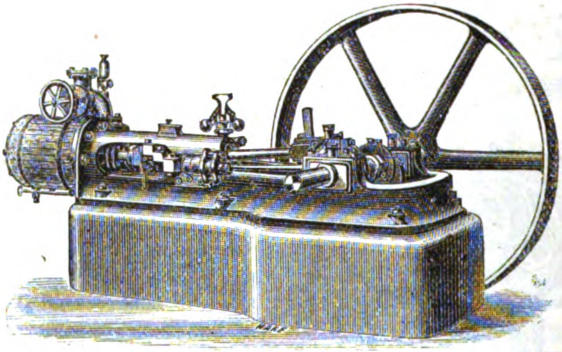
SUPERIOR TRACTION ENGINES,

3, 5, 7, and 9 H.P., with Two Speeds of Steel Gear, Patent Winding Drum, Church's Patent Valves, Steel Boilers, &c.

HORIZONTAL STATIONARY ENGINES.

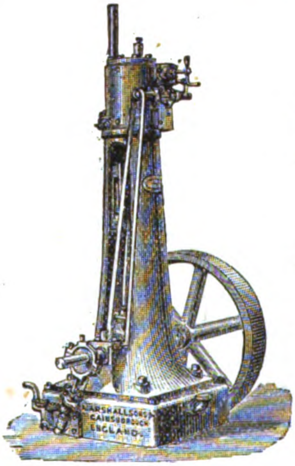
Classes A and B, with or without Automatic Expansion Valve Gear.

3 to 10 H.P.



Classes C and D, High Pressure or Condensing.

10 to 35 H.P.

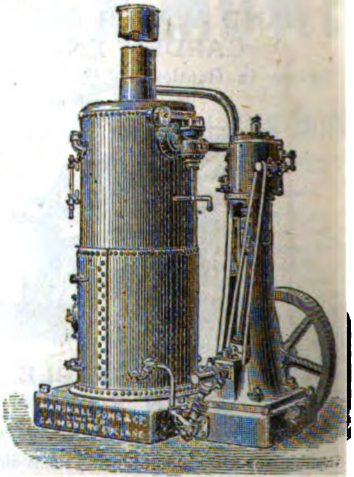


VERTICAL Engines & Boilers.

$1\frac{1}{2}$ to 12 Horse Power.

Sawing, Grinding, & Pumping Machinery.

Illustrated Catalogues on Application.



Paris Universal Exhibition, 1878, Two Gold Medals, Silver Medal, and Honourable Mention,

In addition to over 160 Gold and Silver Medals from the leading Agricultural Societies in this country and abroad.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

E. S. HINDLEY, BOURTON, DORSET.

SMALL STEAM ENGINES,

STATIONARY OR ON WHEELS.

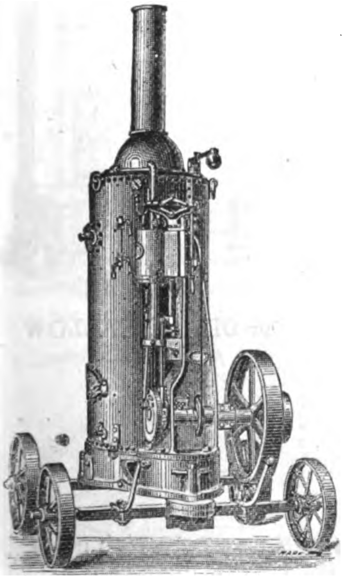
HONOURABLE MENTION, PARIS EXHIBITION, 1878.

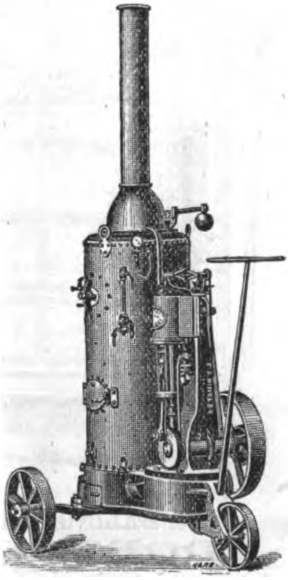
Prize Medals awarded in 1877 at Ayr, Derby, and Burton-on-Trent; also 1878 at Carlisle and Leek; and Manchester 1879, &c. &c.

These Engines are recommended as being strongly made, very compact, easily managed, and in every way well adapted to do the work of the farm, such as CHAFF-CUTTING, PULPING, GRINDING, CRUSHING, driving small THRASHING MACHINES, ELEVATORS, CIRCULAR SAWS, &c. &c.

They are far more economical in work than Horse Power, and cheaper in first cost; a 2-Horse Power Engine and Boiler costing no more than one good Horse.

NOMINAL HORSE POWER	1	1½	2	3	4	5	6	8	10	12	15
Engine and Boiler combined, on Water Tank Foundation........	£ 39	£ 47	£ 55	£ 70	£ 88	£ 100	£ 115	£ 135	£ 157	£ 180	£ 230
Engine and Boiler mounted on three travelling wheels, with handle complete	41	49	57	75	95	110	125	—	—	—	—
Engine and Boiler on four travelling wheels, and fitted with shafts for horse	42	50	59	79	97	112	128	150	—	—	—





Illustrated Catalogues and numerous Testimonials on application.

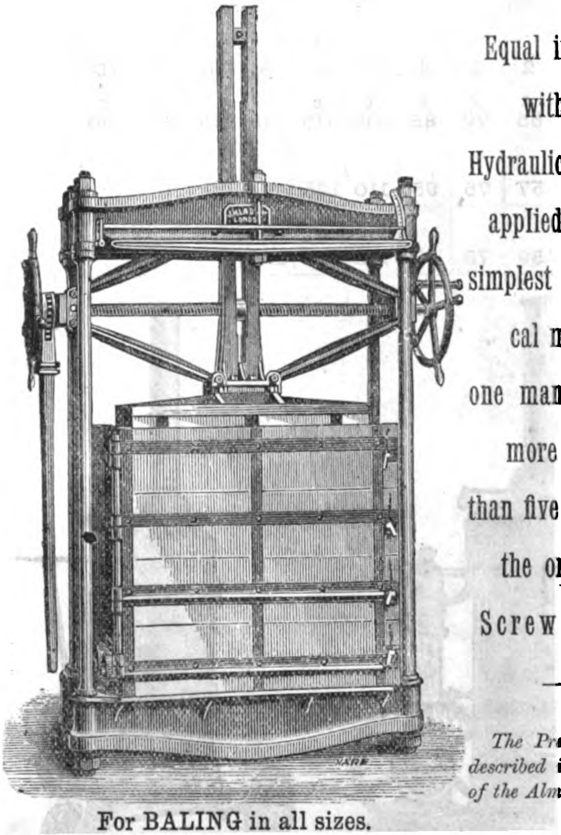
E. S. HINDLEY, Bourton, Dorset.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

THE BOOMER PRESS.

4 Medals Awarded
Paris Exhibition 1878.

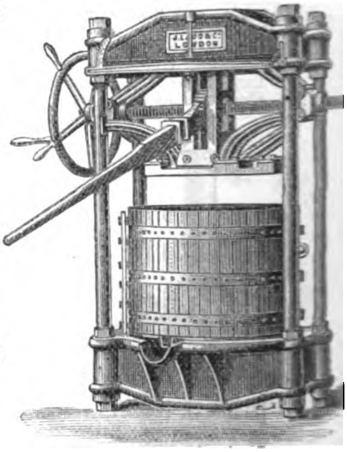
For Wool, Cloth, Cotton, PAPER, HAY, Cider, Wine,
LARD, TALLOW, Seed, Oils, &c. &c. &c.



For BALING in all sizes.

Equal in power with the Hydraulic Pressure applied by the simplest mechanical means, one man exerting more power than five men with the ordinary Screw Press.

The Press is fully described in the body of the Almanack.



For OIL and TALLOW GREAVES.

ADOPTED BY H.M. GOVERNMENT.

Full particulars Post Free on application to

J. H. LADD & CO.

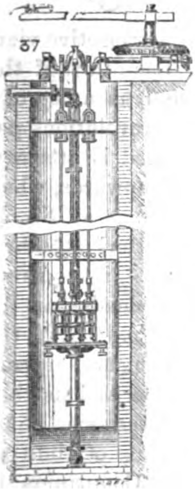
116 QUEEN VICTORIA STREET, LONDON, E.C.

S. OWENS & CO.

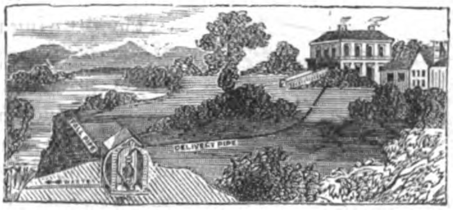
HYDRAULIC AND GENERAL ENGINEERS,

WHITEFRIARS IRONWORKS, Whitefriars Street, Fleet Street, LONDON.

Agent in Scotland:—W. HUME, 195 Buchanan Street, Glasgow.



Deep Well Pumps for Horse or Bullock Power.



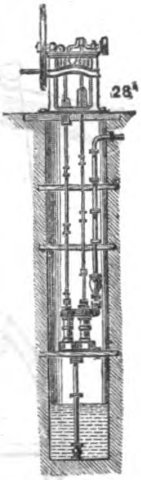
THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying public or private establishments, farm buildings, railway stations, &c.

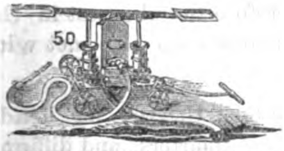
S. O. & Co. ALSO MANUFACTURE

OVERSHOT, BREAST, OR UNDERSHOT WATER-WHEELS, TURBINES, AND PUMPS,

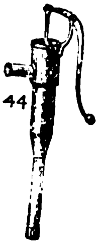
For Raising Water to Mansions or for Driving Threshing, Sawing, or other Farm Machinery.



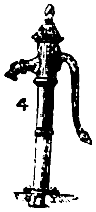
Deep Well Pumps for Hand Power.



No. 50—Double-barrel Farm Fire Engines, or Liquid Manure Distributors. From 3 in. to 6 in. barrels.

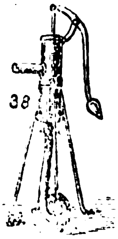


No. 44—Wrought Iron Portable Pump for Liquid Manure.

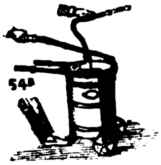


No. 4—Cast Iron Yard, Farm, and Cottage Pumps.

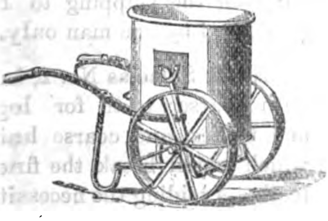
No. 18. Brass Lift Pumps, on Plank.



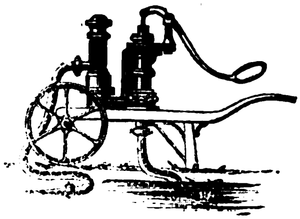
No. 38—Portable Pump, for emptying Manure Tanks, Cesspools, &c.



No. 54B—The Cassiobury Fire Extinguisher, as designed for the Earl of Essex.



No. 49A—Galvanized Swing Water Carriers for Garden Use.



No. 46A—Double Action Force Pump on Barrow, for Watering Gardens and Distributing Liquid Manure.

No. 49—Garden Engines in Oak or Galvanized Iron Tubs.

S. OWENS & CO. manufacture and erect every description of Hydraulic and General Engineers' work for Mansions, Farms, &c., comprising Pumps for Deep and Shallow Wells, Warming Apparatus, Baths, Drying Closets, Gas Works, Apparatus for Liquid Manure Distribution, Hydrants, Hose, Pipes, &c. &c. Particulars taken in any part of the country.

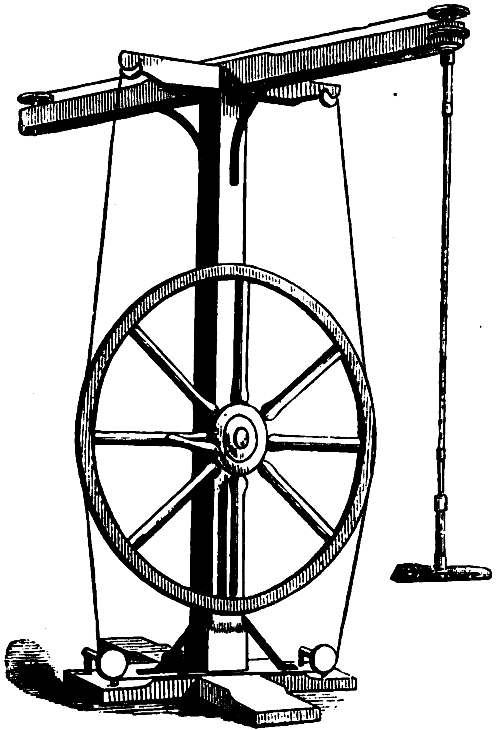
PLANS AND ESTIMATES FURNISHED.

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

PARIS EXHIBITION, 1878.

SILVER MEDAL Awarded to

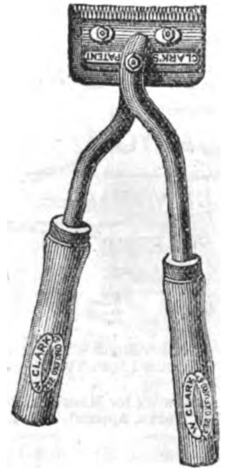
W. Clark's Case of Horse Clippers, and Apparatu for Horse Clipping and Sheep Shearing.



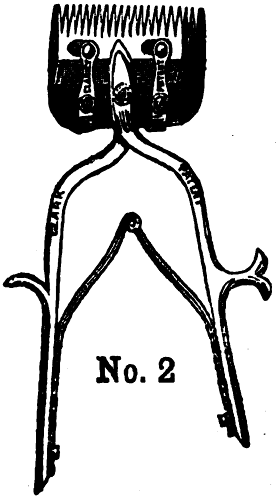
Price, with One Cutter, £14. 14s.: Two Cutters, £20.

The drawing represents a perspective view of the driving apparatus. Each turn of the wheel produces 32 cuts, and as a boy can easily produce from 80 to 90 revolutions per minute, the extraordinary speed is attained of 2,560 cuts per minute and upwards, when one driving rod only is used, as at No. 1, but three extra rods with cutters attached can be fitted at Nos. 2, 3, and 4, if required, so that from one to four animals can be operated upon at the same time. Or, in the case of clipping a horse, by using two driving rods, one man may clip the upper and another the lower and under parts at the same time. This will prove a great saving of time to owners of studs and Horse Companies in general.

No. 1. This well-known instrument has now been before the public for many years, and has given universal satisfaction, and is everywhere acknowledged to be by far the best, and therefore the cheapest in the market. Nos. 2 and 3 have also met with great success.



Each of these Machines can be used for Sheep Shearing.



No. 2

No. 2. One-handed Clipper, for heads, manes, quarters, and difficult parts, leaving one hand at liberty to hold the horse, thus enabling the Clipping to be performed by one man only.

No. 3. Same as No. 2, but with coarser teeth for legs and bellies, and coarse hair, which would break the finer teeth. Avoiding the necessity of getting under the animal, and the consequent liability of accident to the man, and also to the machine itself.

W. CLARK, 232 Oxford Street, London, W.C.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

THE 'PENNSYLVANIA,'

THE LATEST AND MOST PERFECT

AMERICAN LAWN MOWER.

EVERY MACHINE UNCONDITIONALLY WARRANTED

This Machine is GUARANTEED to be

The Lighest Running,
The Swiftest Cutting,
The Simplest in Construction,
The Easiest to Work,
OF ANY LAWN MOWERS IN THE WORLD.

Price List post free on application to the
SOLE EUROPEAN CONSIGNEES,

LLOYD, LAWRENCE, & CO.

34 WORSHIP STREET, FINSBURY, LONDON, E.C.

PATENT COMBINED

THRASHER

AND STRAW

ELEVATOR,

AWARDED
FIRST CLASS MENTION,
LONDON, 1879.

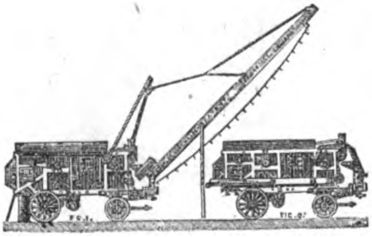


Fig. 1, Fixed for Work.

Manufacturers:

NALDER AND NALDER,

LIMITED,
WANTAGE,
ENGLAND.

Fig. 2, Packed for Travelling.

Delivers at any angle and any height without stopping. Catalogues Free.
Can be attached to any make of Thrashing Machine.

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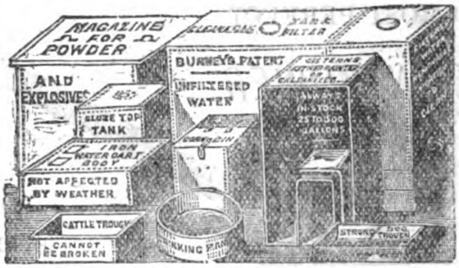
ALL GOODS MADE WITH

BURNEY'S PATENT SOLID CORNERS.

ENTERED AT STATIONERS' HALL.

Agricultural Hall.



Stand 79.

BURNEY & CO.

MILLWALL DOCKS, LONDON, E.

Sole Makers of Ships' Tanks to the Royal Navy.

ONLY HOLDERS of PRIZE MEDALS for CISTERN and CATTLE TROUGHS WITH REGISTERED SAFE EDGE.

NOTE.—The Lords of the Admiralty have ordered all Royal Navy Tanks to be made with BURNEY'S PATENT CORNERS. All Tanks at these Works made with the same.

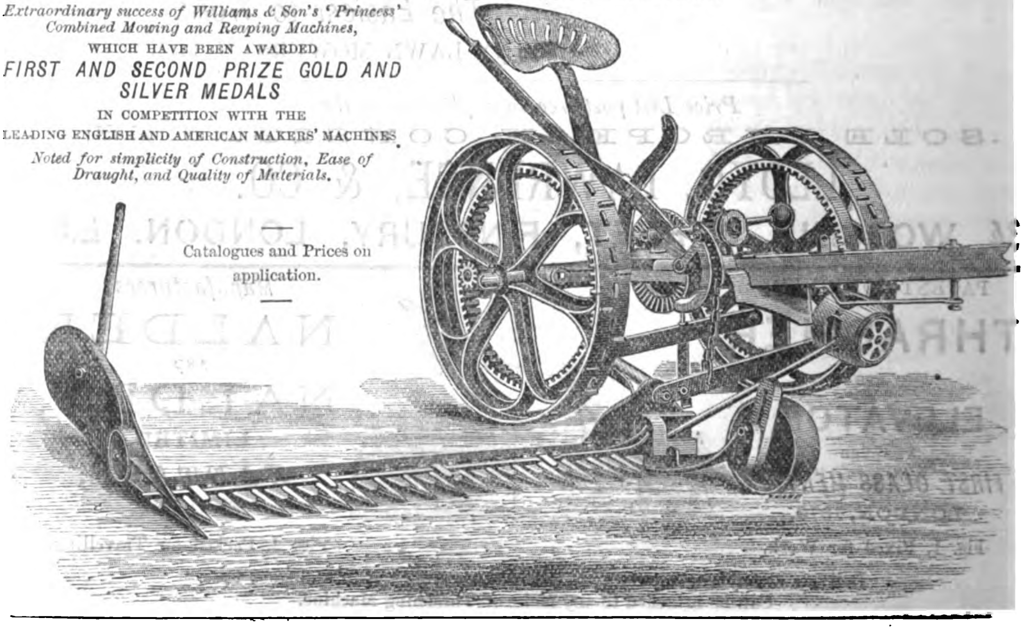
JOHN WILLIAMS & SON, Phœnix Ironworks, Rhuddlan, near Rhyl,

MANUFACTURERS OF

Chaff-Cutters, Root-Pulpers & Slicers, Oil-Cake Mills, Horse-power Works, Clod Crushers, Land Rollers, Single and Double Row Turnip Drills, Mangling and Wringing Machines, Pig Troughs, Mowing and Combined Mowing and Reaping Machines, &c.

Extraordinary success of Williams & Son's 'Princess' Combined Mowing and Reaping Machines,
WHICH HAVE BEEN AWARDED
FIRST AND SECOND PRIZE GOLD AND SILVER MEDALS
IN COMPETITION WITH THE
LEADING ENGLISH AND AMERICAN MAKERS' MACHINES.
Noted for simplicity of Construction, Ease of Draught, and Quality of Materials.

Catalogues and Prices on application.



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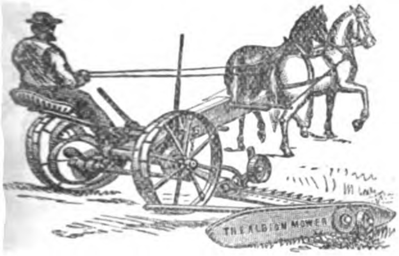
HARRISON, McGREGOR, & CO.'S
'ALBION'
MOWERS AND REAPERS

ARE ADAPTED FOR EVERY VARIETY & CONDITION OF GRASS & GRAIN CROPS.

hey are the best finished, simplest, handiest, most efficient, lightest in draught, strongest, and most durable Machines in the Market.



H. McG. & CO.'S MOWERS AND REAPERS HAVE GAINED

139 First Prizes, Gold & Silver Medals, Cups, &c.

At the PRINCIPAL FIELD COMPETITIONS held in Great Britain and Ireland since 1873, and in France during the past three seasons; also Two First Prizes at Timaru, New Zealand, in October 1877, having beaten every known machine of any note, whether of British or American make, including Hornsby & Sons', Walter A. Wood's, Samuelson & Co.'s, Osborne & Co.'s the Johnston Company's, the 'Champion,' the 'Buckeye,' Bamlett's, Kearsley's, Picksley, Sims, & Co.'s, Williams & Son's, Jack & Son's, Brigham & Co.'s, Bickerton & Sons', and numerous others.

The '**ALBION**' has Won one or more of the Highest Prizes at every competitive trial in which it has taken part.

The demand for these Machines has every year steadily and largely increased, proving their great superiority, and the appreciation in which they are held by the farming community. Many Thousands are in use and giving the greatest satisfaction all over the World.

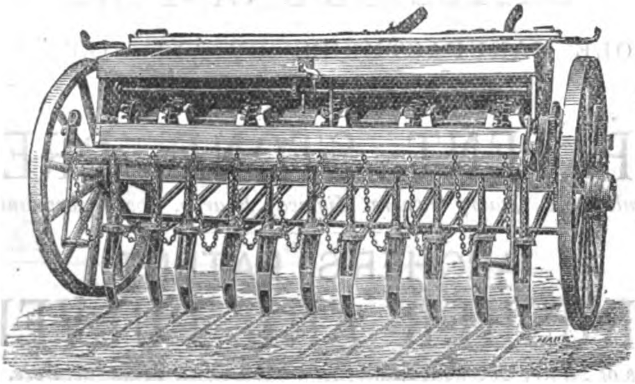
Thirty-eight First Prizes, Gold and Silver Medals, &c. have been awarded to these Machines during the **1879** SEASON alone, in the principal Field Trials and Exhibitions, in competition with the machines of the leading makers in the world.

Catalogues and all particulars will be sent on application, Post Free.

Address: ALBION IRON WORKS, LEIGH, near MANCHESTER, ENGLAND.

KELL'S
PATENT BRITISH ECONOMICAL STEEL LEVER DRILL

Has been awarded the Four Silver Medals of the Royal Cornwall, Worcestershire, Shropshire, and Herefordshire, Agricultural Societies for the best Corn Drill;



Also the Prize of the Glamorganshire Agricultural Society as a One-horse Drill for Turnips, in competition with Turnip Drills.

One Hundred per Cent. is Saved by Using the

PATENT BRITISH ECONOMICAL STEEL LEVER DRILL,

As it is worked with less than half the number of horses and men required for the ordinary make of Drills. Agriculturists, before purchasing any other Drill, should see the testimony of those who have used the above, which, with Price Lists, can be obtained on application to the Makers,

KELL, MEATS, & CO., Ross, Herefordshire; and Gloucester;

OR ANY RESPECTABLE IMPLEMENT AGENT.

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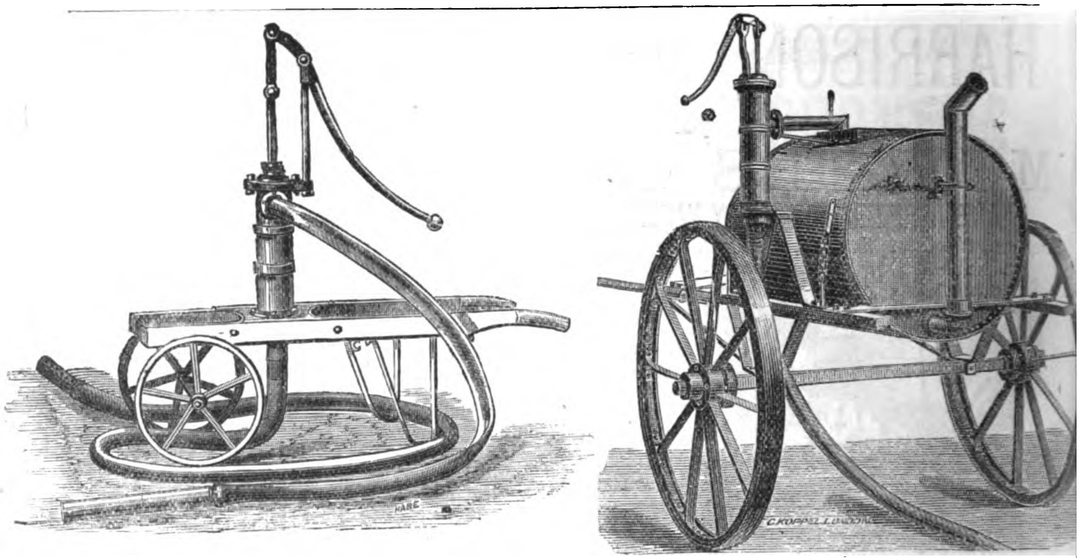

OSMOND'S WROUGHT IRON WATER CARTS are the Best and most Durable manufactured. Made of Various Sizes for all Agricultural Purposes.

OSMOND'S PATENT WROUGHT IRON WHEELS are Strong, Light, and Durable, adapted for Wagons, Carts, Engines, Machines, Trollies, &c. &c. The only Wheel in which all parts can be Replaced in case of accidents. Worthy the attention of agriculturists and others.

IMPROVED HARROWS, PUMPS, CULTIVATORS, &c.

ILLUSTRATED LIST WITH TESTIMONIALS ON APPLICATION.

Address:—**NEWTOWN IRON WORKS, RAMSBURY, WILTS.**

THE DUNSTON ENGINE WORKS COMPANY,

GATESHEAD-UPON-TYNE.

SOLE MANUFACTURERS OF ALL SIZES OF

ARCHER'S NEW PATENT STONE BREAKER,

For Landowners, Quarry Owners, Highway Boards, Contractors, and others.

ARCHER'S PATENT ORE CRUSHER AND PULVERISER,

For Owners of Mines, Chemical Manufacturers, Cement Manufacturers, and others.

ARCHER'S PATENT BONE CRUSHER & PULVERISER,

For Agriculturists.

N.B.—A week's trial of any of the above Machines will be allowed by the D. E. W. Co. to *bonâ fide* customers on satisfactory references being given.

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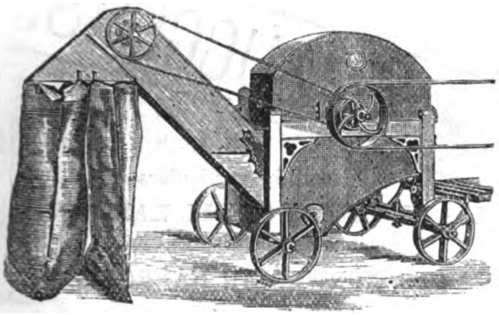
TWO PRIZE MEDALS—PARIS EXHIBITION, 1878.



CARSON & TOONE,

WILTSHIRE FOUNDRY, WARMINSTER,
WILTS.

CANTERBURY PRIZE CHAFF ENGINES.

WITH IMPROVEMENTS. PATENTED 1872.

FOR STEAM POWER. (Stop and Reverse Action.)

R.A.S.E. only Prize at Canterbury. Highly commended at Bury and Oxford.

Prices--No. 1AA, £16. 16*s.*; No. 1A, £15. Portable, £21 and £19. 10*s.* With Bagging Apparatus, £28 and £26. 10*s.*; with Sifter, £10. 10*s.* extra.

For Horse or Hand-power, No. 3A, stop and reverse, £11, Ditto 1C, £8. 10*s.* For Hand-power, the best of their class, from £6 to £2. 10*s.*

MOODY'S PATENT PRIZE TURNIP CUTTERS.

Nos. 1 and 2, with CARSON & TOONE'S IMPROVEMENTS.

Prices—£4. 10*s.* and £4. 15*s.*; wheels and handles, £5. 10*s.*; for steam power, £5. 10*s.* Have received many prizes and commendations from the R.A.S.E. and other societies. Cut more rapidly than any other, separate the dirt from the clean slices, and are very durable.

HORSE GEARS.

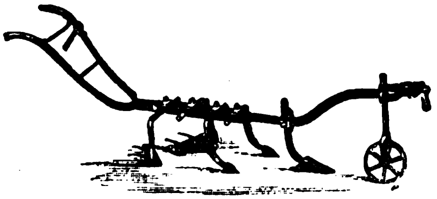
Suitable for driving Chaffcutters, Corn Mills, and Root-cutters. Two-horse, £15. 15*s.*; One-horse, £9.

PRIZE CHEESE PRESSES.

Prize Medal, Paris, 1878; and Honourable Mention, London, 1862, and Paris, 1867; and Five First Prizes. Prices from £3 to £10. Lilliput, Single, £2. 12*s.* 6*d.*; Double, £5.

PRIZE HORSE HOES.

Prize Medal, Paris, 1878, and Eight First Prizes. Prices—£3. 10*s.* to £4. 17*s.* 6*d.*



CARSON & TOONE'S PATENT AUTOMATIC LAMB CREEPS.

New principle, spring action, adjustable, safe, and humane. Prices—£1. 17*s.* 6*d.* and £1. 12*s.* 6*d.*

Illustrated Catalogues free on application.

THE SUPERIORITY OF HATHAWAY'S CHURN

Was thoroughly established as the greatest Butter-producing Churn in existence at the last great trial of the Royal Society of England at Oxford, when in the **Cream** competition against all the principal Churn Makers of the Kingdom it produced **2 lb. more** Butter than any other Churn, and was awarded the Society's Prize of £3. 10*s.* In the same contest it made **2 lb. 3½ oz. more** than Tinkler's Churn, **2 lb. 5 oz. more** than Waide's Churn, **2 lb. 11½ oz. more** than Robinson & Richardson's Churn, and **2 lb. 2 oz. more** than Thomas & Taylor's Churn; and after a more severe trial, it again surpassed them all, taking the Prize of £3. 10*s.* and a high commendation from the Judges, as verified by the Society's Official Report.

Awarded the only Medal given for CHURNS at the GREAT DAIRY SHOW of 1876, held at the Agricultural Hall, London; and also the special one given by the British Dairy Farmers' Association for Metallic Mouth Improvements.

Send for Testimonials and all particulars of the sole Inventor and Maker,

G. HATHAWAY, Churn Works, CHIPPENHAM, WILTS.

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THE ROYAL AGRICULTURAL SOCIETY'S SHOW, HULL.

All the **FIRST PRIZES** at the last great Trials for Cultivators and Broadshares
Awarded to

C. CLAY,

Stennard Works, WAKEFIELD,

In competition with all the best
known Implements.

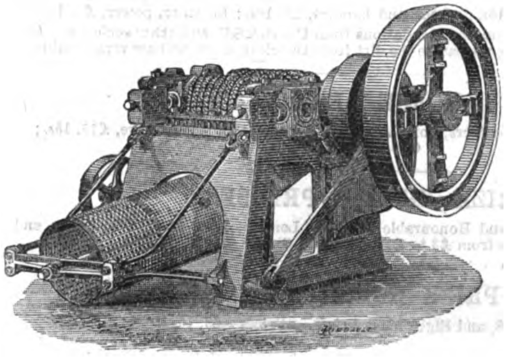
UNPARALLELED SUCCESS.

TRADE MARK

See
Catalogues, Post Free,
and for particulars of
CLAY'S PATENT CHISEL HARROW
(quite a new Implement),
PATENT HORSE HOES, NORWEGIAN HARROWS, &c.

Also Pamphlet by C. C. on Spring and Autumn Cultivation.

The Savile Street Foundry and Engineering Company Limited, Sheffield.



Manufacturers of Crucible Cast Steel Castings.
And Sole Makers of
Hall's Patent 'Multiple Action Stone' Breakers.
Hall's Patent Combined Multiple Action Stone Breakers and Crushing Rolls.
Hall's Patent Farmers' Bone Mill and Screen.
HALL'S PATENT BONE DUST MILL.
BAKER'S PATENT ROTARY PRESSURE BLOWER AND ENGINE COMBINED.
BAKER'S PATENT ROTARY PUMP.
Crucible Cast Steel Castings
For Agricultural Engineers, Machinists, &c.
For Catalogues, apply at the Works.

PAMPHILON & COMPANY,

MAKERS OF

PAMPHILON'S PATENT FARM-YARD MANURE SPREADER.

ONLY ONE REQUIRED FOR ANY FARM.

Silver Medals awarded at Falmouth and Long Sutton.

PAMPHILON & CO.'S PATENT ARTIFICIAL MANURE SPREADER,

Awarded Prizes after Competition at Cowbridge, Manchester, and Long Sutton.

PEYTON'S PATENT SMOKE CONSUMER.

COMPLETE COMBUSTION. FUEL SAVED.

ILLUSTRATED CATALOGUES, TESTIMONIALS, AND PRICE LISTS POST FREE ON APPLICATION TO,

PAMPHILON & CO., WHITTLESFORD, CAMBRIDGE.

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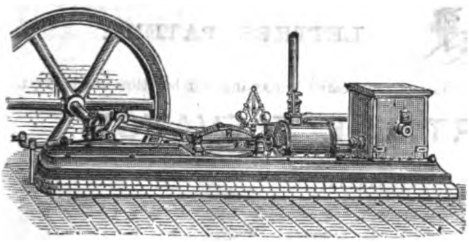


ENGINEERS,
READING,
BERKS.

Manufacturers of R.A.S.E. First Prize Engines,
Horizontal, Vertical, & Portable.

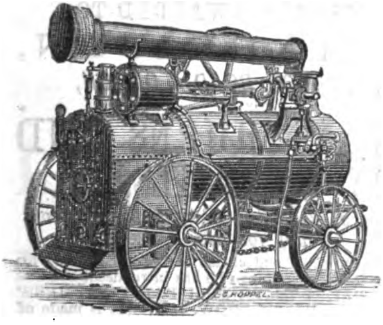
Catalogues Free by Post.

THE READING IRON WORKS, LIMITED.

PATENT
"NOZZLE" BOILERS.

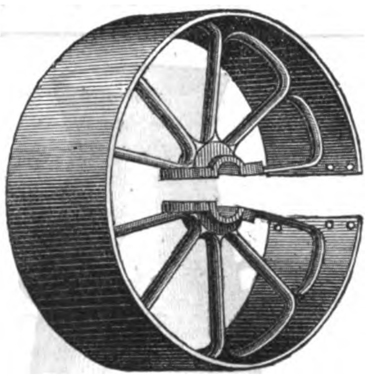
IMPROVED TRACTION ENGINES.

ROYAL PRIZE HAYMAKERS.
Patent 'Lock' Horse Rakes.



Thrashing Machines,
Chaff Cutters,
Grain Mills, and all
Farm Requisites.

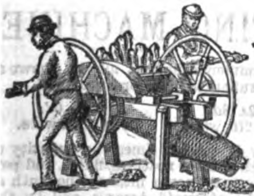
Manufacturers of the
PATENT
WROUGHT IRON
SPRING PULLEYS.



Patronised by Her Majesty's Government.

31 FIRST ROYAL AND OTHER PRIZES

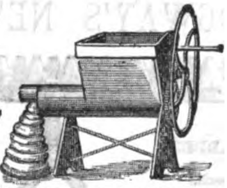
AWARDED FOR



BONE OR STONE CRUSHERS.

LIQUID MANURE OR WATER CARTS.

CHAIN PUMPS.



MORTAR TEMPEPER.

BONE CRUSHERS (for Hand or Power)	15 to 28 gns.	CHAIN AND PORTABLE PUMPS	3½ to 20 gns.
STREET WATER VANS	46 to 50 gns.	SANITARY CARTS	20 to 28 gns.
STREET WATER CARTS	23 to 30 gns.	ROAD SCRAPERS AND SWEEPERS	3½ to 29 gns.
LIQUID MANURE CARTS	12 to 20 gns.	REVOLVING SCREENS	6 to 10 gns.
GRAVEL CRUSHERS	21 to 24 gns.	MORTAR TEMPERING MACHINES	6½ gns.

To I. JAMES & SON, TIVOLI WORKS, CHELTENHAM.

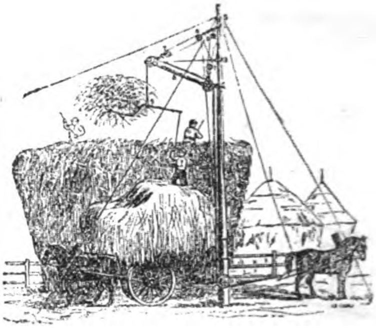
SECURED BY ROYAL LETTERS PATENT.

Simplicity and effectiveness combined, saving of time and labour when time is of the greatest importance—in hay-time and harvest

YORATH'S PATENT PORTABLE ELEVATOR.

FOR STACKING HAY AND CORN, WITH IMPORTANT IMPROVEMENT.

PRICE, complete (as recommended) . . .	£12 0 0
Iron Bars, extra	0 10 0



By the use of the above Patent Horse-fork Elevator, a wagon load of Hay or Corn can be raised to the loftiest stack in 5 or 8 minutes, and will keep 6 men pitching in the field in full employ wtth the greatest ease to man and horse.

Three ordinary labourers can erect the Elevator in 15 or 20 minutes, and it works quite free and easy.

Inventor and Patentee—H. YORATH,
Manure and Implement Merchant,
2 WINDSOR PLACE, CARDIFF.

FOUR MEDALS AWARDED TO

W. J. HARRISON,

208 WATERLOO ROAD, LONDON,

FOR

RAILWAY CHURNS AND DAIRY UTENSILS, &c.

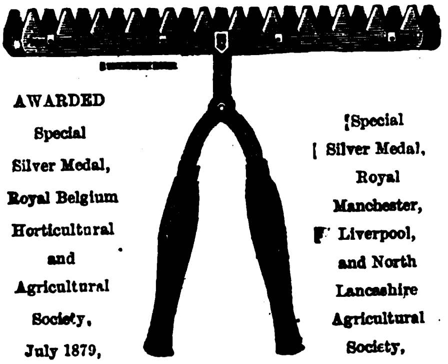
Every Article used in the Dairy kept in stock ready for use.

W. J. H. wishes to call the attention of Dairy Farmers who send Milk by rail to the new Churns he has introduced, and was awarded the MEDAL of the BRITISH DAIRY FARMERS' ASSOCIATION at the DAIRY SHOW, 1877. It is made of extra strong Tinned Iron, and without bands and casing. That being so, it is obvious there is nothing to break or get out of order, and it is fitted with a Mallable Cast-Iron Top, which will not break or bend with ordinary usage; and the Churn is said by all to be the cleanest, strongest, and best one ever made for Railway use.

Illustrated Catalogues and Price Lists free on application to the Sole Manufacturer,

W. J. HARRISON, 208 Waterloo Road, London.

RIDGWAY'S NEW PATENT HEDGE CUTTING MACHINE.



AWARDED
Special
Silver Medal,
Royal Belgium
Horticultural
and
Agricultural
Society,
July 1879,

Special
Silver Medal,
Royal
Manchester,
Liverpool,
and North
Lancashire
Agricultural
Society,

And the Medals and Highest Commendations at all the Shows at which it has been exhibited and submitted to a practical trial.

Price, £1. 7*s*. 6*d*.	£1. 12*s*. 6*d*.	£1. 17*s*. 6*d*.
To cut 18in. wide.	To cut 2ft. wide.	To cut 3ft. wide.

This instrument will not only do several times the quantity of work, but completes the work with greater neatness, finish, and perfection than is possible by any other known means; the truth of this is indisputably shown by the aforesaid Awards, and by the Testimonials and Newspaper Reports, and also the fact that in less than twelve months after the Invention was made public, it was patronised by Her Majesty the Queen, and upwards of 1,000 of the nobility alone, many of which have, without being solicited, spoken of its merits quite as highly as before stated, of which I append a brief one:—

'Sir Kenneth Kemp encloses P.O.O. £1. 12*s*. 6*d*. payable to Mr. A. Ridgway, for a medium-sized Hedge Cutting Machine, which he finds answers the purpose admirably, and is undoubtedly a great economiser of labour.

'Chigwell, Essex, July 25, 1879.'

A great number of others may be seen by applying to the Patentee,

18 MARKET PLACE, MACCLESFIELD.

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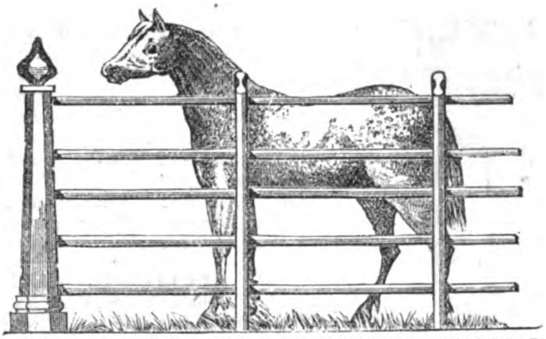
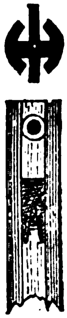
PATENT CONTINUOUS IRON FENCING.

THE BEST AND STRONGEST EVER OFFERED TO THE PUBLIC.

NO BREAKAGE. NO REPAIRS EVER REQUIRED.





FOR PARKS AND GENERAL ENCLOSURES.

R. S. MONCASTER'S PATENT CONTINUOUS FENCE is unequalled. No rivets, no welds, or offsets required. The standards are self-fixing, and secure a firmer hold of the ground than any other known, the horizontal bars being secured with sliding keys inserted in the dovetailed groove, prevent them ever being moved without the aid of a hammer.

PATENT FENCING from 1s. 2d. per yard.

Illustrated and Price Catalogues of Patent Fencing, Tree Guards, Gates, etc., free on application.

R. S. MONCASTER,
IRON FENCE MANUFACTURER,
KIRK-ELLA, HULL.

WILEY'S CHEMICAL ESSENCE,

FOR LAMENESS IN HORSES.

WILEY'S ESSENCE is the SAFEST cure for SPAVINS.

WILEY'S ESSENCE is a PERFECT cure for CURBS and SPLINTS.

WILEY'S ESSENCE is the best application for SPRAINS of the BACK SINEWS.

WILEY'S ESSENCE reduces CALLOUSED or HARD SWELLINGS.

WILEY'S ESSENCE is a SAFE, MILD, EFFECTIVE, CHEAP, & EASILY APPLIED BLISTER.

WILEY'S ESSENCE will not blemish or injure the Hair, however often used.

WILEY'S ESSENCE has been tested for 40 years, and is unsurpassed by any other remedy for LAMENESS in HORSES.

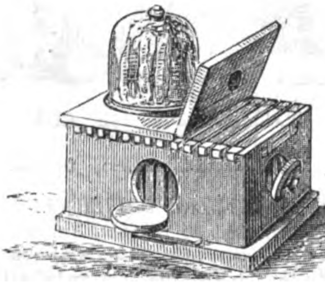
WILEY'S ESSENCE is prepared only by

JOHN ROOKLEDGE
(LATE WILEY),
CHEMIST, EASINGWOLD.

Sold in Bottles at 1s. 6d. and 2s. 6d. each, by all Medicine Vendors.

BEE HIVES.

'THE HIVE OF HIVES.'



PETTITT'S METAL RACK BAR FRAME HIVES FOR EASY MANIPULATION.

PETTITT'S NEW ILLUSTRATED CATALOGUE is now ready; price, post free, three stamps.

Prize Medals were awarded to W. J. PETTITT at the Great Exhibition, 1851; Paris, 1867; Liskeard, 1870; and at the Crystal Palace, Sydenham, 1875.

PURE LIGURIAN BEES—imported Queens—beautiful stocks or swarms, carefully packed and forwarded to all parts; also English Bees.

Please address—

W. J. PETTITT, APICULTURAL INSTITUTE, DOVER.
⁂ *Apiaries*—SNARGATE ST. & HARDWICKE RD.

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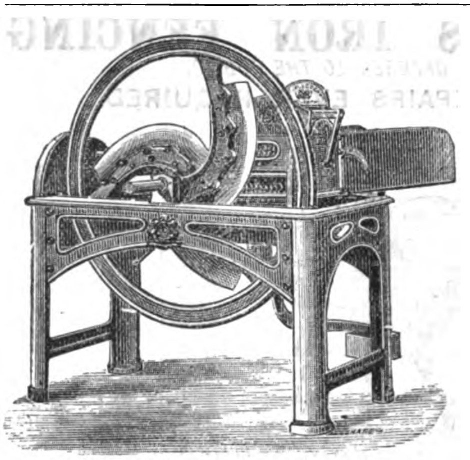


THOMAS ALLCOCK,

RATCLIFF-ON-TRENT, NOTTS.

NEW PATENT SAFETY CHAFF CUTTER

Impossible for the feeder to have his hands cut. Especially adapted for large consumers of Cut Chaff. It is made in four different sizes (11, 12, 13, and 14 in. mouth) with three Knives. The Mouth is Steel Plated, rising from 2 to 5 in. Cuts two lengths without stopping the machine, has Reverse and Stop Motion, and Patent Lever to prevent accidents to the feeder.

T. A. also makes a New Portable Chaff Cutter, exhibited at the Royal Society's Show at Liverpool. It has Three Knives, 14 in. Mouth, will Cut the Chaff, Screen out the Dust, and Bag the Chaff at the rate of 2 tons per hour.

Price List on application, and for any other size.

HORSE GEARS

Suitable for Chaff Cutters, Corn Mills, and Root Pulpers.
One Horse, £3. 10s.; Two Horse, £15.
Drawings sent on application.

THE CHURN QUESTION SETTLED!

BRISTOL, 1878.

THE PRIZE OF £10

OFFERED BY THE

Royal Agricultural Society of England,

FOR THE

BEST CHURN TO MAKE BUTTER FROM CREAM,

Was Awarded at Bristol, July 1878,

AFTER a Series of TRIALS with the Leading Makers, to

E. TAYLOR'S Patent Eccentric Churn.

Price Lists on application.

Sole Makers,

THOMAS & TAYLOR, Stockport.

Extract from the Journal of the Royal Agricultural Society of England, 1879, page 146 :—'Guided by the quality of the butter and the general results of the repeated trials, we awarded the first prize to No. 2,244, Messrs. Thomas & Taylor.'

SPAIN'S PRIZE MEDAL

AMERICAN CEDAR CHURNS.

STATIONARY BARREL,
REVOLVING DASHER,
FOLD-UP STAND.

SPAIN'S PATENT CHURNS **are manufactured of Genuine White Cedar, and have obtained a wide celebrity for ease and efficiency in working, strength, lightness, extreme cleanliness, durability, and cheapness. The barrel is stationary, fitted with a revolving dasher, which is instantly removable for cleansing purposes.**

PRICES, complete, with Stand.

		£	s.	d.			£	s.	d.
No. 1.	To churn 7 qts.	1	6	6	No. 4.	To churn 5 galls.	1	18	6
„ 2.	„ 10 „	1	8	6	„ 5.	„ 7 „	2	10	0
„ 3.	„ 15 „	1	12	6	„ 6.	„ 10 „	3	5	0

LLOYD & Co., 34 Worship Street, London, E.C.

THIRTY-FIRST EDITION.

WARREN'S FARMER'S ACCOUNT BOOK.

Price—Folio, for Large Farms, 8s.; Quarto, for Small Farms, and for Schools where Youths are trained for Agricultural Pursuits, 5s. Also, Folio, with pages for a Weekly instead of a Daily Account of Labour, 7s.

Royston: John Warren. London: Simpkin, Marshall, & Co.; Whittaker & Co.;
Longmans & Co.; Ridgway.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

W. WAIDE,

SOUTH BROOK STREET,

HUNSLET LANE, LEEDS.

THE LAST GREAT TRIAL OF CHURNS AT BRISTOL,

JULY 1878.

Extracts from 'THE JOURNAL OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND:—

The Churns which made the Best Butter are numbered in the Society's Catalogue, viz. WAIDE, 2,021; Taylor & Wilson, 2,087; Thomas & Taylor, 2,244.

Result of Second Trial with Cream:—

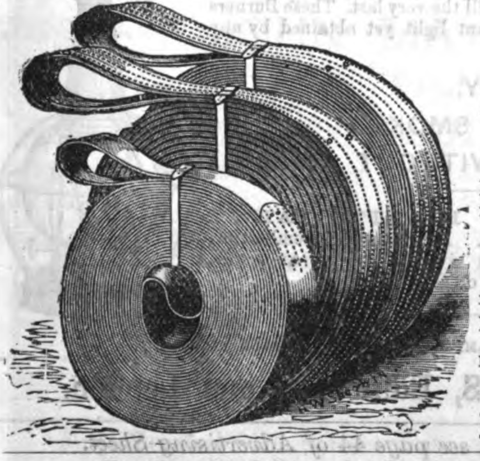
Catalogue No.	Name of Exhibitor.	Article.	Quantity of Cream.	Time.	Quantity after passing through Butter-Worker.
2021	W. WAIDE	BARREL CHURN	30 lbs.	31 minutes	11 lb. 12 oz.
2245	Thomas & Taylor	Eccentric	do.	24 ,,	11 ,, 12 ,,
6337	H. E. Mines	American	do.	21 ,,	11 ,, 12 ,,
1003	Tinkler & Co.	Barrel Churn	do.	19 ,,	11 ,, 10 ,,
2362	Bradford & Co.	Midfeather	do.	23½ ,,	11 ,, 8 ,,
2244	Thomas & Taylor	Self Ventilator	do.	24 ,,	11 ,, 8 ,,
1972	Robinson & Richardson	Barrel Churn	do.	25 ,,	11 ,, 8 ,,
1973	Robinson & Richardson	Barrel Churn	do.	25 ,,	11 ,, 8 ,,
1954	J. Brown	Barrel Churn	do.	33 ,,	11 ,, 8 ,,
1022	Follows & Bate	Barrel Revolving Beaters	do.	37½ ,,	11 ,, 6 ,,
2355	Bradford & Co.	Declivity	do.	15 ,,	11 ,, 4 ,,
1807	Llewellyn & Son	Barrel Churn	do.	23 ,,	11 ,, 4 ,,
2088	G. Hathaway	Barrel Churn	do.	35 ,,	11 ,, 4 ,,
2087	Taylor & Wilson	Dexter	do.	12½ ,,	11 ,, 0 ,,
2117	E. Ahlborn	Vertical	do.	15 ,,	10 ,, 12 ,,

The Third Trial of Selected Churns with Cream:—

No.	Name of Exhibitor.	Article.	Quantity of Cream.	Time.	Weight of Butter after passing thro' Butter-Worker.
2021	W. WAIDE	BARREL CHURNS	21 lb.	18½ minutes	3 lb. 11¼ oz.
2244	Thomas & Taylor	Eccentric	do.	19 ,,	3 ,, 10½ ,,
2342	Bradford & Co.	Midfeather	do.	15 ,,	3 ,, 10¼ ,,
1973	Robinson & Richardson	Barrel Churn	do.	15 ,,	3 ,, 9¼ ,,
2008	G. Hathaway	Barrel Churn	do.	16½ ,,	3 ,, 9¼ ,,
1807	Llewellyn & Son	Barrel Churn	do.	14½ ,,	3 ,, 8¾ ,,

Waide's Churns proved themselves at this Trial to be the Best Butter-makers in this country.

SEND FOR A CATALOGUE.



HEPBURN & GALE,

Tanners and Manufacturers of

LEATHER MACHINE BANDS,

LEATHER HOSE PIPES, &c.

Their wire-sewn **'COMPOSITE'** is the best Band yet introduced for Portable Engines; it will bear more strain than any other, and will travel straight.

Excelsior Compound or Glutinous Belting Syrup,

for Preserving Leather Belting and increasing its gripping power.

'It is an invaluable compound.' 'Effects a very large saving of power.'—*See Testimonials.*

PRIZE MEDAL, 1861, 1855, and 1862.

LONG LANE, SOUTHWARK, LONDON.

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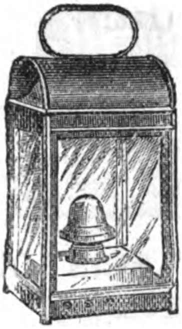

SHAW'S
PATENT WINDPROOF
LAMPS
AND
LANTERNS.

For Shipping, Railways, Factories, Farmers, and the Stable.

Estimates given for any kind of YARD, PASSAGE, or STABLE LAMP.

These Lanterns, while freely admitting air sufficient to ensure the perfect combustion of the flame, are windproof.

No expensive Globe or Chimney Glass required in these Lanterns.

PATENTEE AND MANUFACTURER:

W. J. SHAW,

23 HACKNEY ROAD.

Double Wick Anucapnic Lamp.

ROWATT'S
PETROLEUM LAMPS.

PATENT ANUCAPNIC SPLIT-WICK BURNERS.

DUPLEX AND SINGLE FLAMES, IN SIX SIZES.

The Patent Split-wick nearly doubles the Capillary Attraction, and a full flame is thus kept up till the very last. These Burners give the largest and most brilliant light yet obtained by any Maker.

WITHOUT CHIMNEY.
WITHOUT SMOKE.
WITHOUT SMELL.

Every Farmer should use **ROWATT'S PATENT SAFETY STABLE LAMP.** No Straw or Combustible Matter can reach the Flame. It gives Seven Candle Light, and Burns Eight Hours at a Cost of One Penny.

Stable Lamp.

Retail of all Ironmongers and Lamp Dealers. Wholesale only of

THOS. ROWATT & SONS, Edinburgh and London.

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LEATHER MACHINE BANDS.

Awarded First-Class Medals at
LONDON, HAMBURGH, COLOGNE,
STETTIN, R.A.S.E. BURY ST. EDMUNDS
ALTONA, VIENNA,
CÜSTRIN, BERLIN,
&c.

FIRE BUCKETS & HOSE
MANUFACTURED BY
WEBB & SON,
COMBS TANNERY, STOWMARKET, SUFFOLK.
PRICE LISTS ON APPLICATION.

STEAM PLOUGH ROPES,
MADE OF BEST HARD STEEL WIRE, SPECIALLY PREPARED FOR THE PURPOSE.

WILKINS & WEATHERLY, Manufacturers,
39 WAPPING, LONDON, E.

VIPAN & HEADLY (LATE HUNT & PICKERING) **LEICESTER**

STAND 145
Smithfield Show
DEC. 8th to 12th
VIPAN & HEADLY
LEICESTER

NOVELTIES
FOR RETAILING MILK
NEW MILK CANS AND CARRIAGES
NEW RAILWAY MILK CANS
PULPERS, CORN-MILLS, HORSE-GEARS,
CAKE-BREAKERS, PLOUGHS, HORSE-HOES, &C.

STAND 145
Smithfield Show
DEC. 8th to 12th
VIPAN & HEADLY
LEICESTER

JOHN MATTHEWS,
The Royal Pottery,
WESTON-SUPER-MARE,
Calls the attention of Nurserymen, Gentlemen's Gardeners, Amateurs, &c.

To the superior quality of the Garden Pots and Garden Pottery manufactured by him. Garden Pots from 2 to 30 inches diameter; Seed, Striking, Fern, and Orchid Pans; Rhubarb and Seakale Pots; Terra-cotta Vases, Italian Baskets, Arborettes, Border Tiles, &c.

PRICE LISTS FREE TO ALL APPLICANTS.

Sheets of Designs, 6d. Book of Designs, 1s.

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ESTABLISHED 1820.

JARED T. HUNT & SON'S

GOD SPEED THE
TRADE — MARK.

BONE SUPERPHOSPHATE OF LIME,
WHEAT, BARLEY, & POTATO
MANURES,
PERUVIAN GUANO,
NITRATE OF SODA, &c. &c.

ALSO

THE LARGEST STOCK OF CRUSHED BONES IN THE UNITED KINGDOM,

Consisting of ½ in., ¼ in., Pulverised for Grass Lands, and Bones specially assorted for Vines.

PHOSPHO-GUANO,

RICH IN PHOSPHORIC ACID AND SOLUBLE PHOSPHATES,
AND IMMEDIATELY AVAILABLE FOR
FEEDING OF PLANTS.

Delivered at any Railway Station, £10. 10s. per ton.

Messrs. JARED TERRET HUNT & SON

(LIMITED),

BOW BRIDGE BONE MILLS AND CHEMICAL MANURE WORKS,

STRATFORD, LONDON, E.;
AND
DOWNHAM MARKET, NORFOLK.

N.B.—Responsible Agents required for Districts unrepresented.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

WESTERN COUNTIES

AND

GENERAL MANURE COMPANY

(LIMITED),

TORPOINT, DEVONPORT,

BONE CRUSHERS,

MANUFACTURERS OF

DISSOLVED BONE, SUPERPHOSPHATE,

AND

MANURES ESPECIALLY ADAPTED FOR POTATOES, CORN, MANGOLD, AND GRASS.

Agents wanted in Districts where not represented.

To be obtained of the Agents in various Districts, or at the Manufactory, Torpoint.

JOHN SHEPHEARD, **Manager.**

HILLS' MANURES.

TURNIP AND MANGOLD WURTZEL MANURE,

CORN AND GRASS MANURE,

OTHER SPECIAL MANURES, AND

SUPERPHOSPHATES OF LIME

(25 TO 40 PER CENT. AND UPWARDS),

MANUFACTURED BY

F. C. HILLS & CO.

SULPHURIC ACID, AMMONIA, AND CHEMICAL MANURE WORKS,

EAST GREENWICH and DEPTFORD, LONDON.

THE FARMERS' MANURE COMPANY, LIMITED.

Having upwards of 150 Shareholders (Tenant Farmers), cultivating 80,000 acres of land.

Factories: ROYSTON & STRATFORD,

This Company manufactures and sells only those Manures which are guaranteed as GENUINE and UNADULTERATED.

DISSOLVED PERUVIAN GUANO.
CORN MANURE, DISSOLVED BONES.
BONE SUPERPHOSPHATE OF LIME.
SUPERPHOSPHATE OF LIME.
MANGOLD, KOHL RABI, and POTATO MANURES.

GENUINE PERUVIAN GUANO, NITRATE OF SODA, RAPE, CAKE, AGRICULTURAL SALT, &c. SUPPLIED.

Particulars will be forwarded on application to

WILLIAM T. NASH, Manager,
ROYSTON, CAMBS.

IMPORTANT TO FARMERS.

VALUABLE AGRICULTURAL ARTICLES
MANUFACTURED BY
S. BRADBURY & CO., LIMITED,
TRANMERE CHEMICAL WORKS, BIRKENHEAD.

BRADBURY'S SHEEP DIPPING POWDER.

"The Best and Cheapest Sheep Dipping Powder."

A most valuable and effectual cure of scab, ticks, and fly; for promoting the health of the sheep and value of the fleece. In Packets, **1s.** each, for 25 Sheep. Thoroughly soluble in cold water; can be used all seasons of the year in all countries.

Used extensively upon the estates of Her Majesty the Queen, Duke of Sutherland, Duke of Buccleuch, Lord Ashtown, Lord Clancarty, Lord Clanbrock, Sir W. W. Wynne, Duke of Westminster, &c.

BRADBURY'S LIQUID CARBOLIC SHEEP DIP.

A new, valuable, and very important non-poisonous Sheep Dip, dissolves readily in cold water, and instantly destroys all insects in the fleece, ticks, lice, and scab. A valuable preventive of fly in hot weather, it is a marvellous destroyer of insect life, and when a non-poisonous dip is desired no other preparation can epual it. In Tins, **6s.** per 100 Sheep. Of the greatest possible value for destroying lice, fleas, &c., on horses, cattle, dogs. Very cheap for large kennels, also of very great importance for the Colonies. Full directions with every tin.

BRADBURY'S CARBOLIC WHEAT DRESSING,

2s. 6d. per gallon. A valuable protection for all kinds of seed against birds, mice, and insects. Preventive of smut, and promotes the germination of the seed.

The value of this Dressing to the farmer is very great, as in the usual way one quarter of all the seed sown is destroyed by birds and insects, all of which is saved by the use of this Dressing. In large wheat countries its importance is very great, and all who sow much grain should use BRADBURY'S CARBOLIC WHEAT DRESSING.

S. BRADBURY & CO., Limited, Tranmere Chemical Works, Birkenhead

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ORSE, CATTLE, AND SHEEP MEDICINES.

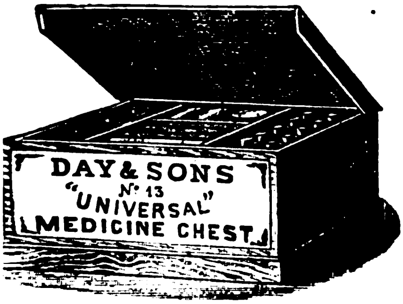
GISTERED.

ADE MARK.

DAY & SONS'

UNIVERSAL MEDICINE CHEST,

FOR ALL DISORDERS IN HORSES, CATTLE, CALVES, SHEEP, AND LAMBS.



This Chest contains an antidote for the cure of almost every disease, external and internal, that Stock are liable to, being fitted with every requisite, and full directions for use, and will keep good for many years.

THIS CHEST CONTAINS THE FOLLOWING CELEBRATED PREPARATIONS:—

The Purified Driffield Oils	for Wounds, Kicks, Cuts, Bruises, &c.
The Black Drinks	for Colic, Scour, &c.
The Red Drinks	for Cleansing after Calving.
The White Oils	for External Injuries, Weak or Swollen Joints.
The Alterative Powders ..	for Coughs, Colds, Sore Throats in Horses.
The Ewe Drenches	for Fevers, Colds, or Chills.
The Foot Rot Oils	
The Husk Draughts	for Husk or Hoose, or Worms.

Price £2. 4s. Carriage Paid.

Any of the Medicines may be had separate, securely packed in Wood Cases.

AWARDED GOLD & SILVER MEDALS & CERTIFICATES OF MERIT.

STABLISHED NEARLY FORTY YEARS.—Patronised by upwards of 85,000 Noblemen, Gentlemen, Practical Agriculturists, and eminent Breeders of Stock throughout the United Kingdom of Great Britain and Ireland.

DAY & SONS, CREWE,

And 172 Albany Street, Regent's Park, LONDON.

EDWARD PURSER & CO.

(LONDON MANURE COMPANY),

Established 1840,

SUPPLY MANURES OF THE HIGHEST QUALITY ON THE BEST TERMS.

DISSOLVED BONES.

The large amount of Phosphates (from 36 to 38 per cent., at least half of which are rendered soluble) are GUARANTEED to be derived entirely from Bone material.

CHEMICALLY TREATED GUANO,

Guaranteed to contain Nine per Cent, Ammonia.

FIXED GUANO.

Guaranteed to contain Seven per cent. Ammonia.

Each Guano contains also from 20 to 22 per Cent. Soluble Phosphate, and 2 to 4 per cent. Insoluble, with Magnesian and Potash Salts.

They are in fine condition, and are sent out in Bags of 1¼ cwt. each, 16 to the Ton.

ALSO

BONE MANURES AND SUPERPHOSPHATES.

Large Consumers treated on Liberal Terms.

EDWARD PURSER & Co., 116 Fenchurch St., London, E.C.

IMPORTANT TO FLOCKMASTERS AND OTHERS.

THOMAS BIGG,

Agricultural and Veterinary Chemist, by appointment to H.R.H. the late Prince Consort, K.G.,

LEICESTER HOUSE, GREAT DOVER STREET, BOROUGH, LONDON.

SHEEP-DIPPING COMPOSITION,

For the Destruction of Ticks, Lice, &c., and for the prevention of Fly, Scab, &c. It is only necessary, in giving orders, to state the number of sheep, to have the right quantity for each sent.

DIPPING APPARATUS, £4, £5, £6, and £16.

IMPORTANT CERTIFICATE FROM MR. HEREPATH, THE CELEBRATED ANALYTICAL CHEMIST.

Bristol Laboratory, Old Park, January 18, 1861.

Sir,—I have submitted your Sheep-Dipping Composition to analysis, and find that the ingredients are well blended, and the mixture neutral. If it is used according to directions given, I feel satisfied that while it effectually destroys vermin, it will not injure the hair roots (or 'yolk') in the skin, the fleece, or the carcase. I think it deserves the numerous Testimonials published.

I am, Sir, yours respectfully,
WILLIAM HEREPATH, Sen., F.C.S., &c., &c., Professor of Chemistry.

To Mr. Thomas Bigg.

PAMPHLETS FREE ON APPLICATION.

IMPORTANT TO AGRICULTURISTS.

For the Protection of Seed Corn from the Ravages of Rooks, Birds, or Vermin, 'Down's Farmers' Friend' is supplied Carbolised.

UNDER THE SPECIAL PATRONAGE OF HER MAJESTY THE QUEEN,
H.R.H. THE LATE PRINCE CONSORT, H.R.H. THE PRINCE OF WALES,

And Patronised by the principal Noblemen, Landowners, and Agriculturists in the Kingdom.

DOWN'S FARMERS' FRIEND

Has stood the test of 40 years, and is acknowledged to be the safest and most effectual preventive of

SMUT IN WHEAT, BARLEY, OATS, &c.,

THE RAVAGES OF THE SLUG, GRUB, AND WIREWORM, AND THE INCURSIONS OF ROOKS AND VERMIN,

As the testimonials and high reputation of the gentlemen whose names they bear will testify.

It will also promote the Germination and Growth of the Seed, and increase the produce of the Crop equal to a change of Seed.

A PACKET IS SUFFICIENT FOR SIX BUSHELS OF SEED, which can be dressed and fit to sow in a quarter of an hour.

Testimonials from the largest Wheat-growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.

Manufactory—WOBURN, BEDS.

Wholesale Agents—Messrs. LANGTON, EDDEN, HICKS, & CLARK, 230 Upper Thames Street, London.

CAUTION.—Each Packet of the Farmers' Friend bears a *facsimile* of the Inventor's Signature—

Henry Down

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NE BOX OF CLARKE'S B 41 PILLS

Is warranted to Cure all Discharges from the Urinary Organs in either Sex, acquired or constitutional, Gravel or Pains in the Back.

Sold in Boxes, 4s. 6d. each,

BY ALL CHEMISTS AND PATENT MEDICINE VENDORS;

Or sent to any address for 60 stamps by the Maker,

J. CLARKE, Consulting Chemist, APOTHECARIES' HALL, LINCOLN.

Wholesale Agents: BARCLAY & SON, London,

And all the Wholesale Houses.

LAND SALT.

BY SPECIAL APPOINTMENT TO THE QUEEN.

ROYAL

BRITISH TABLE SALT,

In Jars, Bottles, and Packets.

SEA SALT FOR BATHS.

D. BUMSTED & CO.

36 KING WILLIAM STREET, E.C.

All kinds of Salt at Lowest Prices.

"To meet the times, and that individual Farmers may be able to provide their Superphosphates without the intervention of any Association, &c."

PRENTICE'S PRIZE CUP SUPERPHOSPHATE

ANALYSIS GUARANTEED.

25 to 28 per Cent. SOLUBLE PHOSPHATES; 30 to 32 per Cent. TOTAL PHOSPHATES.

70s. PER TON.

FREE ON RAILS IN BUYERS' BAGS WHEN CASH IS SENT WITH ORDER.

If Bags supplied by the Makers, an extra charge of 3s. 6d. per Ton. If Orders not prepaid, an extra charge of 5s. per Ton.

RAILWAY CARRIAGE:—PRENTICE BROS. will, on application, obtain special rates for quantities. The current freights between the Factory and any Station will be quoted by return of post.

Address: PRENTICE BROS., Chemical Works, STOWMARKET.

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SANDERS & CO.

MARBLE, STONE, AND GRANITE WORKS,

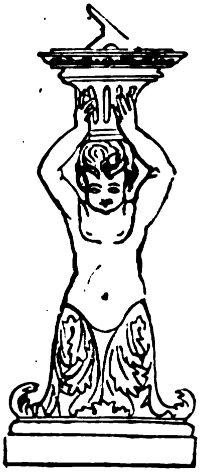
ALSO MANUFACTURERS OF

AUSTIN'S ARTIFICIAL STONE,

365 EUSTON ROAD, FITZROY SQUARE.

SANDERS & CO. having recently purchased the larger part of the Mo of Garden Ornaments from the late firm of Austin & Seeley, beg to offer their servi any gentleman who may intend placing such work in his grounds. They would specially attention to the large collection of Fountains which, through their long course of 50 y Austin & Co. had been led by frequent demands from the public to design, and which adapted, by variety of style and dimensions, to meet almost any case that can be propo to them.

Hundreds of Designs of Fountains, Vases, Statues, Baske Shells, Sun-Dials, Animals, &c.



S. & Co. beg to state that they have always on view a large stock of Granite and Marble Monuments, and shall be happy to communicate with any gentleman requiring such a work.

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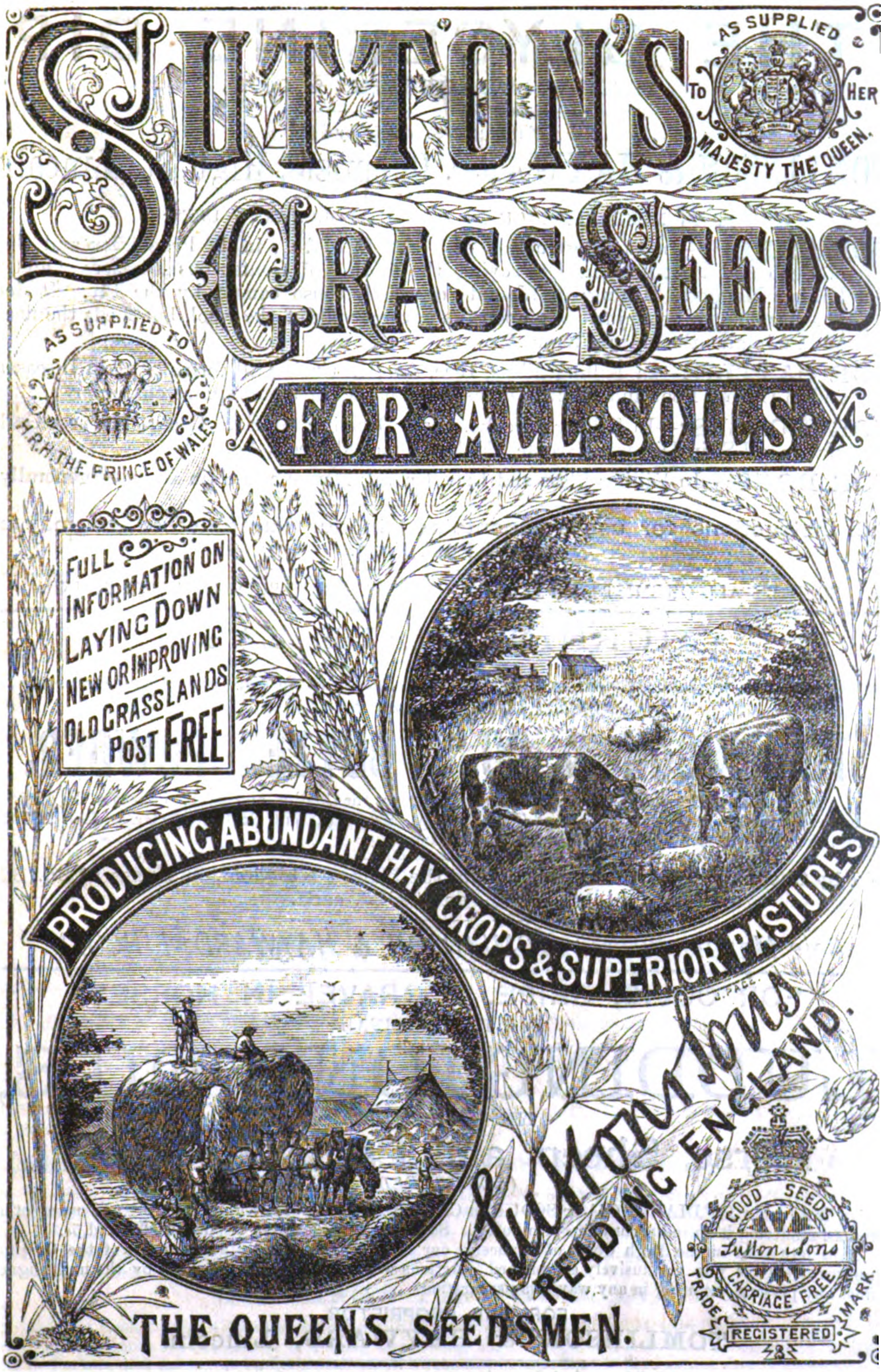
SUTTON'S
GRASS SEEDS
AS SUPPLIED TO HER MAJESTY THE QUEEN.
AS SUPPLIED TO H.R.H. THE PRINCE OF WALES
FOR ALL SOILS
FULL INFORMATION ON LAYING DOWN NEW OR IMPROVING OLD GRASS LANDS POST FREE
PRODUCING ABUNDANT HAY CROPS & SUPERIOR PASTURES
Sutton & Sons
READING ENGLAND.
GOOD SEEDS
Sutton Sons
CARRIAGE FREE
TRADE MARK.
REGISTERED
THE QUEENS SEEDSMEN.

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THE GLYCERINE DIP

(HARDWICKE, GUERIN, & CO.'S).

Manufactured solely by

TOMLINSON & HAYWARD, Chemists, High St., Lincoln.

IT IS MOST EFFICACIOUS IN THE FOLLOWING USES:—

FOR SHEEP:—In the Destruction of Ticks, Lice, &c.; in the Prevention and Cure of Scab and Foot-Rot; in Destroying the Germs of Contagious Diseases; and in Killing Maggots, Healing all Wounds, especially those caused by the Fly. It does not discolour or act injuriously upon the natural yolk of the wool, but feeds the fleece and maintains the natural lustre.

FOR CATTLE:—In Killing Fleas, Lice, &c.; in Curing all forms of Skin Diseases, and in Curing Foot and Mouth Disease, and others of a contagious character.

FOR HORSES:—In Killing Lice &c.; as a Dressing for Sore Backs, Harness Galls, Mange, all Skin Diseases, Grease, Canker, Cracked Heels, &c.

FOR DOGS:—In Killing Fleas and Lice, Curing Mange and Skin Diseases generally.

Full instructions for use are contained in our Pamphlet, which may be had Post Free.

SOLD BY ALL CHEMISTS, IN TINS AND DRUMS, PRICE SIXPENCE PER POUND.

CHURNING MADE EASY!

The difficulty so much experienced in obtaining Good Butter in Summer and other seasons of the year is entirely overcome by using

TOMLINSON & CO.'S BUTTER POWDER.

Its use considerably lessens the time of Churning, improves the Quality, and greatly increases the Yield of Butter; removing all unpleasant flavour of Cake, Turnips, Mangolds, Wild Garlic, Sour Grass, &c. A little put into the milk will also increase the Quantity of Cream.

Sold by Chemists and Grocers throughout the United Kingdom, in Boxes at 3d., 6d., 1s., 2s. 6d., and 7s. 6d. each.

Sole Manufacturers: TOMLINSON & HAYWARD, LINCOLN.

FOR COLIC, GRIPE, & GRAVEL IN HORSES.

USE THE ORIGINAL

'LUDDINGTON'S OILS,'

THE CELEBRATED

Horse, Sheep, and Cattle Medicine.

(*REGISTERED.*)

Is also invaluable for DIARRHŒA or SCOUR in CALVES, FOALS, SHEEP, or LAMBS, and many other purposes, rendering it an indispensable Farm bottle. Sold by all Chemists, in Bottles, 2*s.* 6*d.* and 5*s.*

In a late trial in the High Court of Chancery, our claim as being the Manufacturers of the Original Luddington's Oils was conclusively established. Actions will at once be commenced by the undersigned against any persons imitating in any way this preparation.

FOR THE PROPRIETOR,

TOMLINSON & HAYWARD, Lincoln.

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HORSES.

Established 1833.

LIEUT. JAMES'S BLISTER.—Used in Her Majesty's Cavalry Regiments, patronised by Major-General Sir Charles Dalbiac, Inspector-General of the Cavalry Forces, and highly eulogised by **Professor** Coleman, of the Royal Veterinary College, London, in his report to the Adjutant-General. Its great **efficacy in all** cases where blistering is usually applied is well known, and its celebrity has extended to all the **great studs** throughout the world. (*No horse will gnaw it.*)

CAUTION.—The annexed label is on the top of every pot of the ORIGINAL and only GENUINE Blister.

The Messrs. Barclay & Sons, 95 Farringdon Street, London, and Messrs. Raimes & Co., Edinburgh, and York, and Liverpool, are now and have been Agents 45 years. The Ointment may also be had of Messrs. Sutton & Co., 10 Bow Churchyard, Cheapside; W. Edwards & Son, 157 Queen Victoria Street; Lynch & Co., 171A Aldersgate Street; Evans, Lescher, & Webb, Bartholomew Close; Newbery & Sons, 37 Newgate Street; Sanger & Son, 252 Oxford Street; Millard & Co., 40 Charterhouse Square; W. Mather, Farringdon Road, London; Woolley & Sons, Manchester; Messrs. Boileau & Co., Bride Street, Dublin; Messrs. M'Master, Hodgson, & Co., Capel Street, Dublin, and Cork; and all Chemists. 1 oz., 1*s.* 6*d.*; 2 oz., 2*s.* 9*d.*; and 4 oz., 5*s.*

COLONIAL AGENTS: *Melbourne and Wellington*—Felton & Co.; *Sydney and Brisbane*—Elliott Brothers; *Dunedin*—Kempthorne & Co.; *Auckland*—Kempthorne & Co.

Advertised in *Bell's Life* 45 years. BEWARE OF A SPURIOUS IMITATION.

R. S. JAMES, 30 Years Sole Manufacturer, Stanford, Faringdon, Berks.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

HAYHOE'S IMPROVED PATENT

SOLVENT, CLEANER, and DISINFECTANT.

A new and valuable discovery for rapidly and effectually removing Old Paint, Oil, Varnish, Japan, Grease, Dirt, and Rust, from Wood, Stone, Metal, Marble, &c.

Messrs. H. P. Hayhoe & Co. Surveyor's Office, Bank of England, *Jan.* 6, 1879.

Gentlemen,—Having heard of your Patent "Solvent" for cleaning purposes, I was induced to try it, and, having used upwards of 100 gallons, I have much pleasure in saying that it has fully borne out all the merits and advantages that you claim for it. I have used it for cleaning painted walls and ceilings that were nearly black, and after the work was finished it had the appearance of being newly painted. I have also used it for removing old paint from doors, an accumulation of about fifty years, and found no difficulty in getting it off clean to the wood with a small amount of labour. Another great advantage is that your "Solvent" does not in the least injure the brushes with which it is applied. I can confidently recommend it, and consider that it only requires to be known to be more generally used.—Yours faithfully, T. G. CARPENTER.

H. P. HAYHOE & CO., Stowmarket, Suffolk.

BROKEN WIND.—MANY A HORSE'S WIND has been saved by the timely use of

GOSTLING'S COUGH BALLS (or Powders),

A wonderfully efficacious remedy for COUGHS, COLDS, INFLUENZA, and LUNG DISEASE in either HORSES or CATTLE. Sold by all Druggists, or post free of GOSTLING & SON, Diss, Norfolk.—Six Balls, 1*s.* 6*d.*; Six Powders, 1*s.* 9*d.*

GOSTLING'S CONDITION BALLS (or Powders) for HORSES

Are excellent in cases of INDIGESTION, LOW CONDITION, SWELLED LEGS, CRACKED HEELS, HIDEBOUND, &c. Hundreds can testify to their efficacy. GOSTLING'S CONDITION BALLS are, moreover, most useful for Cattle. Bullocks thrive faster and 'do' better with an occasional dose of these Balls (*or Powders*). Six Balls, 2*s.* 6*d.*; Six Powders, 2*s.* 9*d.* Sold by all Druggists, or post free of GOSTLING & SON, Diss, Norfolk.

GOSTLING'S PIG POWDERS

Are useful in almost every ailment of SOWS and PIGS of all ages. They act as a preventive of Milk Fever and Garget, promote the health and well-doing of growing Pigs, and greatly facilitate the fattening of Pigs. Sold in Packets of 5 for 1*s.*, or 15 for 2*s.* 6*d.*, of all Druggists, or post free of GOSTLING & SON, Diss.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

BY ROYAL APPOINTMENT,

TO HER MAJESTY,
By Special Warrant, dated December 27, 1865.

TO THE PRINCE OF WALES,
By Special Warrant, dated February 10, 1866.

DAY, SON, & HEWITT,

INVENTORS AND SOLE PROPRIETORS OF THE 'ORIGINAL'

STOCK-BREEDERS' MEDICINE CHESTS,

FOR ALL DISORDERS IN HORSES, CATTLE, CALVES, SHEEP AND LAMBS,

And Inventors of the First Animal Medicines ever known as 'Day's.'

The No. 2 MEDICINE CHEST contains the following matchless remedies:–

- 'THE CHEMICAL EXTRACT,' for Cuts, Bruises, Sore Udders, and Ewes Lambing.
- 'THE GASEOUS FLUID,' for Colic in Horses, and Scour and Debility in Cattle and Sheep.
- 'THE RED DRENCH,' for Cleansing after Calving and Lambing, Fevers, &c.
- 'THE RED PASTE BALLS,' for Conditioning Horses.
- 'THE GASEODYNE,' for Parturition in Mares Ewes, &c.
- 'THE BRONCHOLINE,' for Husk, Hoose, or Cough in Sheep or Calves.
- 'THE ALCOHOLIC ETHER,' for Colds and Chills.
- 'THE CARMINATIVE CHALK,' for Diarrhœa in Lambs and Calves.

PRICE of CHEST, with GUIDE to FARRIERY … … … £2. 16s. 6d.

No. 1 COMPLETE MEDICINE CHEST, £6. 6s., Carriage Paid.

USED FOR OVER FORTY YEARS THROUGHOUT THE UNITED KINGDOM AND THE BRITISH COLONIES.

THE KOSSOLIAN SALT OR BLOOD SALT,

FOR HORSES, COWS, OXEN, SHEEP, AND CALVES.

Its saline and ferruginous elements prevent languor, exhaustion, want of energy, and loss of appetite. All animals should have an ounce or two of the **KOSSOLIAN** or **BLOOD SALT** mixed with their food once or twice a week, from the hunter down to the carriage horse and hack. All young animals, whether colt, calf, or lamb, should have half an ounce of the **KOSSOLIAN** or **BLOOD SALT** mixed with their food, for it is a safeguard against contagious diseases, and it is destructive to the parasites in the bronchial tubes, causing that distressing malady the Hoose or Husk. It converts the food, while in the stomach, rapidly into flesh and bone making elements, and gives a firmness to the flesh to resist all poisonous effluvia; and it also renders all animals capable of enduring with safety the heat of summer and the cold rains and sleet of winter.

Sold in Boxes, containing one dozen packets, price 12s. Beware of imitations.

DAY, SON, & HEWITT,

22 DORSET STREET, BAKER STREET, LONDON, W.; & WANTAGE, BERKS.
ESTABLISHED 1834.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

THE

NUBIAN BLACKING

For Ladies' and Gentlemen's Boots and Shoes.

THE NUBIAN BLACKING is perfectly waterproof.

THE NUBIAN BLACKING will not rub off, or soil ladies' skirts.

THE NUBIAN BLACKING need only be applied once a week.

THE NUBIAN BLACKING will not crack.

THE NUBIAN BLACKING gives a polish equal to patent leather.

THE NUBIAN BLACKING keeps the leather soft and pliable.

THE NUBIAN BLACKING will polish Belts, Travelling Bags, Harness, and all Leather Goods.

SOLD RETAIL BY ALL BOOTMAKERS.

Wholesale only at 1 Worship Street, Finsbury, London, E.C.

TRADE MARK

FREEMAN'S CHLORODYNE

Is the ORIGINAL and ONLY TRUE,

Is allowed to be the greatest discovery of the present century, and is largely employed by the most eminent Medical men, in hospital and private practice, in all parts of the globe.

Is the best remedy known for *Coughs*, *Colds*, *Consumption*, *Bronchitis*, and *Asthma*.

It effectually checks those too-often fatal diseases *Fever*, *Ague*, *Croup*, *Whooping Cough*.

It acts like a charm in *Diarrhœa*, and is the only specific in *Cholera* and *Dysentery*.

It effectually cuts short all attacks of *Epilepsy*, *Hysteria*, *Palpitation*, *Convulsions*, and *Spasms*.

It is the only palliative in *Neuralgia*, *Rheumatism*, *Gout*, *Tic Doloreux*, *Cancer*, *Toothache*, and all *Nerve Pain*.

It rapidly relieves pain, from whatever cause; allays the irritation of fever; soothes and strengthens the system under exhausting diseases; and produces quiet and refreshing sleep.

TESTIMONIALS.

The Right Honourable Earl Russell graciously transmitted to the inventor of Chlorodyne, Mr. R. FREEMAN, and to the Royal College of Physicians of London, the following:—Extract of a Despatch from Acting-Consul Webb, dated Manilla, September 17th, 1864:—"The remedy most efficacious in its effects (in Epidemic Cholera) has been found to be CHLORODYNE, and with a small quantity given to me by Dr. Burke I have saved several lives."—See *Lancet*, 1st December 1864.

From CHARLES LINTON ALEXANDER, Fellow of the Royal College of Surgeons, England, &c.—"FREEMAN'S Original CHLORODYNE is a preparation that I am using many times a day; I have the greatest confidence in it, and find it of the greatest value in the treatment of Diarrhœa, Chronic Bronchitis, and Consumption."

From JOHN TANNER, M.D., L.R.C.P., M.R.C.S., L.S.A., L.M., Physician to the Farringdon Dispensary, London.—"It gives me great pleasure to bear testimony in favour of FREEMAN'S CHLORODYNE. I have prescribed it extensively, and find it in every respect far superior to any of the spurious compounds sold under the name of CHLORODYNE. In cases of Asthma, Chronic Bronchitis, the last stage of Phthisis, and the Winter Cough of the aged, I have never found any substitute or chemical combination its equal; moreover, in all cases where a sedative is required, it is a certain, safe, and agreeable remedy."

From T. D. SWALLOW, M.D., M.R.C.S. Eng., L.S.A., Surgeon to the Royal South London Dispensary, and Medical Officer to the London City Missions, &c.—"I have great pleasure in stating that I am constantly prescribing FREEMAN'S CHLORODYNE in Consumption and Asthma, and as a sedative in Cancer, and in cases of Diarrhœa and Dysentery I am daily witnessing its striking effects."

From DAVID EASTON, M.D., B.A., L.R.C.S., Medical Officer to Rhins of Galloway Poorhouse, Stranraer, Wigtonshire, Scotland.—"I consider your CHLORODYNE a valuable remedy. It has succeeded perfectly in those cases in which I have used it. In its action it is uniform, and in its effect most efficacious."

THE 'TIMES,' AUGUST 13, 1877.

FROM OUR OWN CORRESPONDENT WITH THE RUSSIAN ARMY.

Okoum, July 25, 1877.—"The want of sanitary arrangements in the Russian Camp was dreadful, and had we remained there a few weeks longer, dysentry and typhoid fever would have played more havoc in our ranks than the bombs of the Turks. I myself acquired an unenviable reputation as a doctor, owing to my being provided with a small bottle of **CHLORODYNE**, with which I **effected Miraculous Cures.**"

From Mons. BONJOUR BARTHELEMY, Delegate of the Society for the Relief of the Wounded, Decorated with the Cross of the Convention of Geneva.—Le Caillon, pres Meung-sur-Loir, France, June 18, 1873.—"I hereby attest that the CHLORODYNE manufactured by RICHARD FREEMAN, Pharmacist, of London, is the best remedy against CHOLERA and DYSENTERY, and further affirm, as Director of the Anglo-American Ambulances and of French prisoners during the war of 1870 to 1871, that a large number of those under my care were attacked with Dysentery, and that by means of his CHLORODYNE they were in a few days perfectly cured.

"(Signed) BONJOUR BARTHELEMY."

From GEORGE F. SMYTH, Esq., Manager Licensed Victuallers' Pure Tea Company.—"9 Curtain Road, London, E.C., September 21, 1875.—Mr. RICHARD FREEMAN.—SIR,—I have taken *your* invaluable 'CHLORODYNE' (especially in the winter time) for some years. When I was advised, at first, to use Chlorodyne, I procured some of Collis Browne's. *It did me no good whatsoever.* I then bought some of *your* preparation. I firmly believe (under God) that it has been the means of prolonging my life. I am affected, or rather *was* affected with severe 'Winter Cough,' but now, when supplied with *your* incomparable specific, I defy my old enemy, and drive him out of the system. I know nothing personally of *you*, Sir, nor, for that matter, of Mr. Collis Browne; but I *know* that *his* preparation of Chlorodyne does *me no good whatsoever*, and it is with deep gratitude to you that I now pass my winters free from cough, and in comfort."

IMPORTANT CAUTION.—Four Chancery Suits terminated in favour of FREEMAN'S ORIGINAL CHLORODYNE, and against the Proprietors of J. Collis Browne's. Lord Chancellor Selborne, Lord Justice James, and Lord Justice Mellish condemned their proceedings, and ordered them to pay all costs of the suits.—Reported in the *Times* and other newspapers, April 29 and July 24, 1873.

None genuine without the words "*Freeman's Original Chlorodyne*" engraved on the Government stamp.—Sold in bottles at 1*s*. 1½*d*.; 2 oz., 2*s*. 9*d*.; 4 oz., 4*s*. 6*d*.; 10 oz., 11*s*.; and 20 oz., 20*s*. each, by all Patent Medicine Dealers, &c., and at the Laboratory, 70 Kennington Park Road, London.

Ask for FREEMAN'S, and see that the Trade Mark, the 'ELEPHANT,' is impressed on each Label and Wrapper, and be not persuaded to buy any substitute.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

DR. J. COLLIS BROWNE'S CHLORODYNE

THE ORIGINAL AND ONLY GENUINE.

CHLORODYNE is admitted by the Profession to be the most wonderful and valuable remedy ever discovered.
CHLORODYNE is the best remedy known for Coughs, Consumption, Bronchitis, Asthma.
CHLORODYNE effectually checks and arrests those too often fatal diseases—Diphtheria, Fever, Croup, Ague.
CHLORODYNE acts like a charm in Diarrhœa, and is the only specific in Cholera and Dysentery
CHLORODYNE effectualy cuts short all attacks of Epilepsy, Hysteria, Palpitation, and Spasms.
CHLORODYNE is the only palliative in Neuralgia, Rheumatism, Gout, Cancer, Toothache, Meningitis, &c.

A FEW DOSES QUITE EFFECTUAL.

CAUTION.—The extraordinary medical reports on the efficacy of Chlorodyne render it of vital importance that the public should obtain the genuine, which bears the words, "Dr. J. Collis Browne's Chlorodyne."

Vice-Chancellor Wood stated that Dr. J. Collis Browne was undoubtedly the Inventor of CHLORODYNE; that the whole story of the Defendant Freeman was deliberately untrue.

Chemists throughout the land will confirm the decision that Dr. J. C. BROWNE was the Inventor of CHLORODYNE.

From W. C. Wilkinson, Esq., F.R.C.S., Spalding:—

"I consider it invaluable in Phthisis and Spasmodic Cough; the benefit is very marked indeed."

Sold in Bottles, at 1s. 1½d., 2s. 9d., and 4s. 6d., by all Chemists.

Sole Manufacturer: J. T. DAVENPORT, 33 Great Russell Street, London, W.C.

DINNEFORD'S MAGNESIA.

For over Forty Years the Medical Profession have approved of this pure Solution as the best remedy for Acidity of the Stomach, Heartburn, Headache, Gout, and Indigestion; and as the safest aperient for delicate Constitutions, Ladies, Children, and Infants.

SOLD BY CHEMISTS THROUGHOUT THE WORLD.

CAUTION.—See that 'DINNEFORD & CO.' is on every Bottle and Label.

BRECKNELL'S

SADDLE SOAP,

Used in the Royal Stables, and by H.M. Cavalry.

Specially prepared for cleaning, polishing, and improving the appearance of Saddles, Accoutrements, and other undyed Leather Articles.

⁂ Each Tin bears the name of 'BRECKNELL,' and the Trade Mark, a 'SADDLE.' None other genuine.

BRECKNELL, TURNER, & SONS,
31 HAYMARKET, LONDON, S.W.

BEWARE OF TRASHY IMITATIONS!

SEED TIME—IMPORTANT TO FARMERS.

NO MORE 'BIRD-TENDING!' NO CROWS! NO SLUGS! NO GRUBS!

TO PREVENT THE GERMINATION OF SEED CORN:
TO ENSURE GOOD CROPS, USE

HOPKINSON'S "BIRD-TENDER,"

A sure preventive of Smut in Seed Corn, is the only discovery that entirely keeps Crows off Wheat, Barley, Oats, Peas, Beans, Potatoes, &c., and totally destroys the Slug, Grub, and Wireworm.

Trade Mark—'BIRD-TENDER.' Sole Manufacturers—T. HOPKINSON & CO., GRANTHAM, LINCOLNSHIRE.

Sold in Packets, enough for one acre, with full directions for use, 9*d*. each. London Agents—Newbery & Sons, Newgate Street; Sanger & Sons, 252 Oxford Street; and may be had of Agents in every town, or direct from the Manufactory.

N.B.—As many spurious and worthless imitations of the above under different Carbolised names are now being introduced, Messrs. H. & Co. caution their friends against all counterfeits by asking for the 'Bird-Tender' only. Any unscrupulous person discovered copying their Bills, Labels, or Advertisements, or in any way infringing their rights, will be forthwith proceeded against, as all are registered and protected.

PAGE WOODCOCK'S WIND PILLS

GOOD FOR THE CURE OF

WIND ON THE STOMACH, INDIGESTION, SICK HEADACHE, HEARTBURN, BILIOUSNESS, LIVER COMPLAINTS, and All Complaints arising from a disordered state of the Stomach, Bowels, or Liver.

Sold by all Medicine Vendors, in Boxes, at 1*s.* 1½*d.*, 2*s.* 9*d.*, and 4*s.* 6*d.* each.

TOWLE'S

PENNYROYAL AND STEEL PILLS FOR FEMALES

Quickly correct all irregularities and relieve the distressing symptoms so prevalent with the sex. Boxes 1*s.* 1½*d.* and 2*s.* 9*d.* of all Chemists. Sent anywhere on receipt of stamps by the Maker, E. T. TOWLE, Chemist, Nottingham.

'THE MILLER,'

THE LARGEST MILLING NEWSPAPER IN THE WORLD,

Is exclusively devoted to the interests of Millers. Subscription: The Technical issue, containing Trade Advertisements, is published the first Monday in the month, 5*s.* per annum, post free to all parts of the world. The Market issue, every subsequent Monday evening, 7*s.* 6*d.* extra; both issues, 12*s.* 6*d.*; single copies of the Technical issue, 5*d.*

'*I never read a copy of* "THE MILLER" (*London*), *that I don't learn something that is worth five years' subscription to it.*'—Inaugural address of the Hon. GEORGE BAIN, *President of the American Millers' National Association, at the Indianapolis Convention, May 28th,* 1878.

'"*The Miller" is the leading milling paper of Great Britain. It is the largest and most comprehensive milling paper published in the world, without exception. We advise all our readers to subscribe.*'—UNITED STATES MILLER, *Nov.* 1879.

Subscriptions to be sent to W. DUNHAM, Office of 'The Miller,' 69 Mark Lane, London, E.C.

MYROBELLA or CHERRY PLUM

IS THE BEST STUFF FOR

MENDING OLD FENCES OR MAKING NEW ONES.

It grows vigorously on the poorest soils, even where Whitethorn will hardly exist, and bears clipping like Whitethorn. Its stiff, hard branches, and long sharp spines, effectually prevent cattle or evil-disposed persons getting through fences made of it. It is a good seaside plant, and thrives under the influence of sea breezes, and, at the same time, like the Plane, maintains its beautiful bright green appearance in the smoke of large towns. Grown as a tree, it is well adapted for small avenues, roadsides, streets, or as a lawn tree, and it is one of the handsomest of all early spring-blooming trees.

FOR FENCING, PLANT ABOUT SIX IN A YARD.

Sizes and Prices on application to

EWING AND COMPANY,

The Royal Norfolk Nurseries, Eaton, near Norwich.

LAMPS, OILS, AND CANDLES,

Gas Lustres, Hall Lamps, and Brackets.

SMITHS & CO.

Beg respectfully to inform Parties Furnishing that they have an ENTIRELY NEW STOCK of GAS LUSTRES and OIL LAMPS of Newest Designs, at strictly Moderate Prices.

Agents for STRANGE'S CELEBRATED A1 CRYSTAL OIL, the Finest Burning Oil in the Kingdom.

PURVEYORS OF LAMPS AND OILS TO THE QUEEN.

89 GEORGE STREET, EDINBURGH (formerly No. 1 Blair Street).

ESTABLISHED 1770.

For Classified List of Advertisers, see page 44 of Advertising Sheet.

'FOR THE BLOOD IS THE LIFE.'

CLARKE'S
WORLD FAMED
BLOOD MIXTURE.

(Trade Mark—'Blood Mixture.')

THE GREAT BLOOD PURIFIER AND RESTORER,

For cleansing and clearing the blood from all impurities, cannot be too highly recommended.

For Scrofula, Scurvy, Skin Diseases, and Sores of all kinds it is a never-failing and permanent cure.

It Cures Old Sores.
Cures Ulcerated Sore Legs.
Cures Scurvy Sores.
Cures Cancerous Ulcers.
Cures Glandular Swellings.

It Cures Blackheads, or Pimples on the Face.
Cures Blood and Skin Diseases.
Cures Ulcerated Sores on the Neck.
Cures the Blood from all Impure Matter
From whatever cause arising.

As this mixture is pleasant to the taste, and warranted free from anything injurious to the most delicate constitution of either sex, the Proprietor solicits sufferers to give it a trial to test its value.

THOUSANDS OF TESTIMONIALS FROM ALL PARTS.

Sold in bottles **2s. 6d.** each, and in cases containing Six times the quantity, **11s.** each—sufficient to effect a permanent cure in the great majority of long standing cases,

BY ALL CHEMISTS AND PATENT MEDICINE VENDORS

throughout the World, or sent on receipt of 30 or 132 stamps by the proprietor,

F. J. CLARKE, Chemist, Apothecaries' Hall, Lincoln.

SULPHINE.

SOLE MANUFACTURERS:

Messrs. WILLIAM BAILEY & SON,

Horseley Fields Chemical Works, WOLVERHAMPTON.

AND AT

Nos. 2 and 3 ABCHURCH YARD, CANNON STREET, LONDON, E.C.

SULPHINE is the most important discovery in medicine that has been made for many years. It is a clear and colourless liquid, possessing very remarkable therapeutical properties.

SULPHINE strikes at the root of numerous diseases, by destroying the germs which enter the system along with the food we eat, the beverages we drink, and the air we breathe.

SULPHINE purifies the blood from these sources of disease, by destroying the germs, or animated cells, which are carried by the circulation to every part of the system, and which propagate with amazing rapidity. It renders all the secretions healthy.

SULPHINE also stops fermentation and prevents putrefaction. It is a powerful disinfectant, and arrests the progress of all epidemics and contagious disorders. It is antagonistic to cholera, typhus, measles, scarlet fever, small-pox, and all *Zymotic* diseases.

SULPHINE, by regulating the fermentation of the food in the digestive organs, is an immediate cure for flatulence and indigestion. It is a specific for chronic dyspepsia, and strikes at the root of all those evils which follow in its train—headache, heartburn, nausea, constipation, debility, &c. By this action it allows time for the food to become properly dissolved by the gastric juice.

Price 1s. 6d. and 3s. per Bottle.

Extract from letter of THOMAS SUTTON, Esq., B.A., Cantab. —'It gives me much pleasure to be able to testify to the merits of SULPHINE as a cure for indigestion. I had been for three years a martyr to that complaint.'

From FRERE ARNOUL, of Rèdon, France.— 'Your SULPHINE has, after a few days, freed me from all painful sensations, and I certainly regained my strength as by enchantment.'

'INDIGESTION CURED BY SULPHINE,' price 2d.; by Post, 3d.

BY APPOINTMENT.

Manufacturers of Chemicals for Telegraphic, Photographic, Pyrotechnic, and other purposes.

Contractors to Her Majesty's War Office, Admiralty, Post Office, India Office, and other Government Departments; also, to the principal Railway and Telegraph Companies in Great Britain.

Great attention is given to the manufacture of Chemicals and other preparations for commercial and scientific use.

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THE LINCOLNSHIRE FARMERS' ASSOCIATION.

Established 10th June 1868, for the purpose of Purchasing GENUINE PHOSPHATIC MANURE of guaranteed quality, and supplying the same to its Members at COST PRICE.

COMMITTEE FOR THE CURRENT YEAR.

CAPTAIN SMITH, *Chairman*.

Mr. William Little.	**Mr. Bruce Tomlinson.**	**Mr. Joseph Scales.**
Major Charles Parker.	**Mr. John Henry Caswell.**	**Mr. Henry John Seck.**

***Analyst and Chemical Referee*—Dr. VOELCKER.** ***Bankers*—Messrs. PEACOCK, HANDLEY, & Co.**

***Solicitor and Secretary*—Mr. CHARLES EDWARD BISSILL.** ***Auditor*—Mr. HENRY BOYER.**

***Office*—SLEAFORD.**

SUPERPHOSPHATE OF LIME is supplied to Members from the Depôts of the Association, and according to Dr. Voelcker's analysis, at *Cost Price*, and guaranteed to be put on Rail in good condition for sowing by hand, or for using with the dry drill, to contain from 24 to 26 per cent. of Soluble Phosphate, and to be delivered (*free of carriage &c.*) at every Station on every Railway in the counties of Lincoln, Rutland, Nottingham, and Huntingdon, and at most of the Railway Stations in the counties of Bedford, Buckingham, Chester, Derby, Gloucester, Hereford, Lancaster, Leicester, Northampton, Oxford, Shropshire, Stafford, Warwick, Worcester, &c., and at *greatly reduced rates* at other Stations in the Kingdom. Members requiring delivery beyond the Association's District pay the Carriage from the nearest point of such District.

Members' Orders must be given on the proper printed form, and must state in what Lots the Manure will be required, in what Months, and at what Railway Stations.

Present Price (26 per cent. Soluble Phosphate), £3. 10*s.* per Ton. Bags, 5*s.* extra per Ton.

Registration Fee, 1*s.* per Ton. Payment a Fortnight before Delivery. Analysis free of cost. Entrance Free, Twopence per Acre on occupation.

The Members are now upwards of 1,100, and occupy upwards of 338,000 Acres of Land.

Gentlemen desirous of joining should apply to the Secretary, Mr. C. E. BISSILL, Solicitor, Sleaford, of whom the Rules, Map of District of Free Delivery, Instructions, Report of Committee, Entrance and Order Forms, &c., and all further information, may be obtained.

SLEAFORD, *October* 1879.

THE BIRKBECK BUILDING SOCIETY'S ANNUAL RECEIPTS EXCEED FOUR MILLIONS.

HOW TO PURCHASE A HOUSE FOR TWO GUINEAS PER MONTH,

WITH IMMEDIATE POSSESSION AND NO RENT TO PAY, apply at the Office of the BIRKBECK BUILDING SOCIETY, 29 and 30 Southampton Buildings, Chancery Lane.

HOW TO PURCHASE A PLOT OF LAND FOR FIVE SHILLINGS PER MONTH,

With Immediate Possession, either for Building or Gardening Purposes, apply at the Office of the BIRKBECK FREEHOLD LAND SOCIETY, 29 and 30 Southampton Buildings, Chancery Lane.

HOW TO INVEST YOUR MONEY WITH SAFETY,

Apply at the Office of the BIRKBECK BANK, 29 and 30 Southampton Buildings, Chancery Lane. Deposits received at varying rates of interest for stated periods, or repayable upon demand.

Current Accounts opened with parties properly introduced, and Interest allowed on the minimum monthly balances. English and Foreign Stocks and Shares purchased and sold, and advances made thereon.

Office hours from 10 till 4, except on Saturdays, when the Bank closes at 2 o'clock. On Mondays the Bank is open until 9 o'clock in the Evening.

A Pamphlet, with full particulars, may be had on application.

FRANCIS RAVENSCROFT, *Manager*.

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THE CHAIN HARROW.

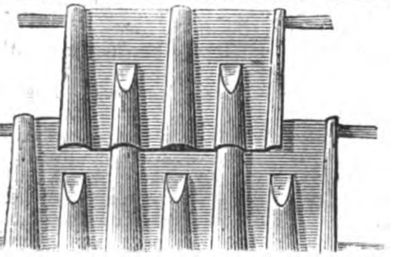
SIMPLE, EFFECTIVE, INEXPENSIVE.

MADE BY DENTON'S PATENTED MACHINERY.

ADDRESS—**HENRY DENTON,**
ST. PETER'S WORKS,
WOLVERHAMPTON.

Prices—One Horse, 35s.; Two Horse, 60s. Carriage paid to any Railway Station in England or Scotland.

POOLE'S PATENT BONDING ROLL ROOFING TILES.



This Tile is superior to all others, by having a bond like slate. They are easily put on, and are proof against wind-stripping and rain-drifting. For price and particulars apply to the Sole Assignee of Patent,

J. MATTHEWS,
Royal Pottery, Weston-super-Mare.

CONSTRUCTED ON A NEW PRINCIPLE.

THIS Invention is admitted by the highest practical authorities to entirely eclipse all other pruning implements intended for similar work. No owner of trees or shrubs should be without it.

PRICES:	s.	d.
4-feet pole . .	8	6
6-feet „ . .	9	6
8-feet „ . .	10	6
10-feet „ . .	11	6

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STANDARD MANUFACTURING CO.,
ST. ALKMUND'S CHURCHYARD,
DERBY,
Or through any Ironmonger or Seedsman.

COWS—TAYLOR'S GENERAL COW DRINKS.

For Stoppage or Mawbound, Milk Fever, Blain, Longslough or Garget, &c. 1*s.* each, 11*s.* per dozen.

COWS—TAYLOR'S CLEANSING DRINKS.

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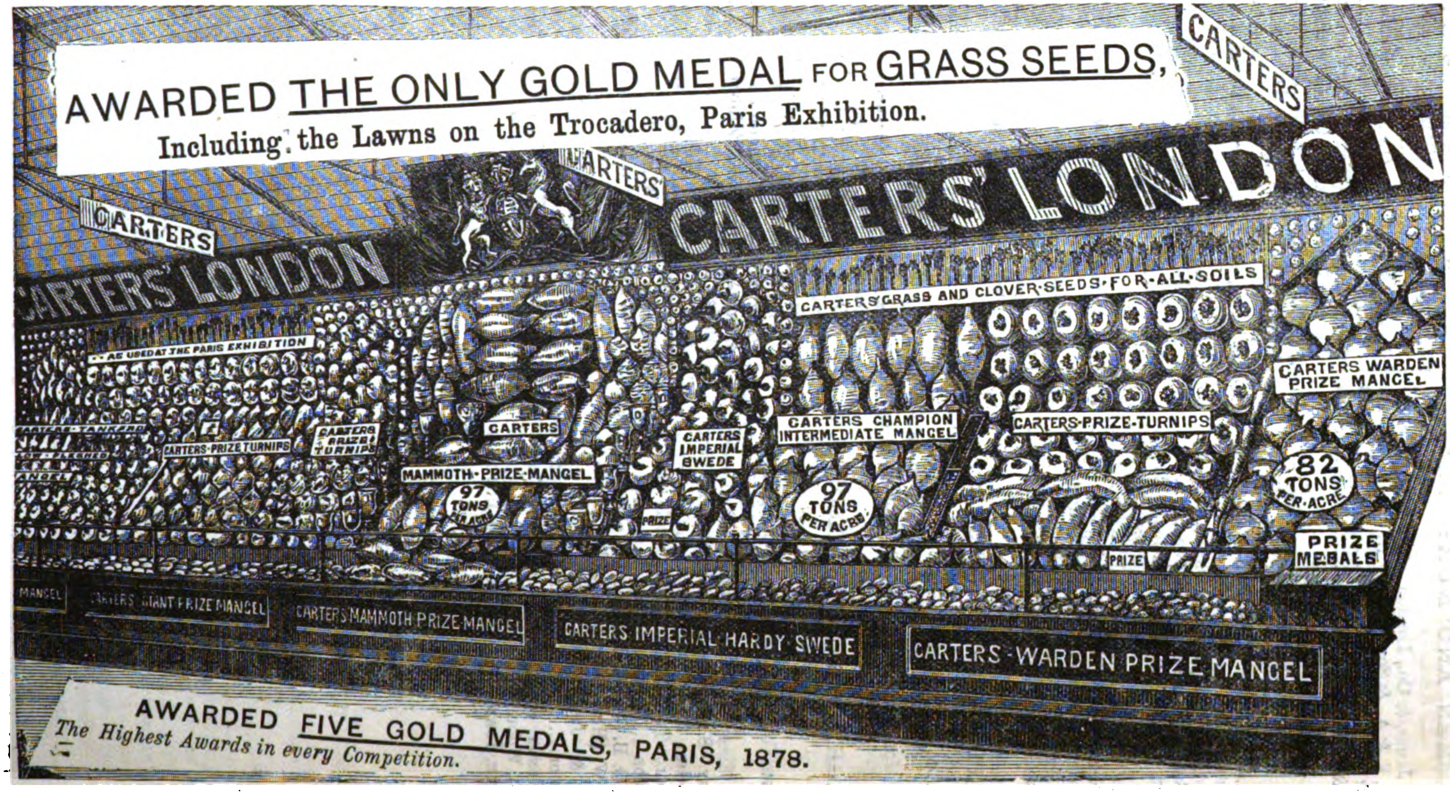
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